

# **Specifications**

**CHILDREN'S LIBRARY WING  
LEON VALLEY PUBLIC LIBRARY  
6425 EVERS RD.  
LEON VALLEY, TEXAS 78238**

August 2012

## **Architect**

**Richard Mogas & Associates, Inc.**

317 Lexington, Suite 4

San Antonio, Texas 78215

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## **Structural**

**AccuTech Consulting LLC**

909 N.E. Loop 410, Suite 900

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## **BID ADVERTISEMENT**

### **LEON VALLEY PUBLIC LIBRARY CHILDREN'S WING**

The City of Leon Valley is currently accepting competitive sealed bids for the **LEON VALLEY PUBLIC LIBRARY CHILDREN'S WING**, the construction of a new 1-story building addition, estimated at \$350,000. The City will accept sealed bids until 10:00 a.m. Friday, August 31, 2012, in the Office of the Purchasing Agent, located at 6400 El Verde Rd, Leon Valley, TX 78238, at which time bids will be publically opened and read aloud.

The plans and specifications are available on the City of Leon Valley's website at [www.leonvalleytexas.gov/government/finance/purchasing.php](http://www.leonvalleytexas.gov/government/finance/purchasing.php). For assistance, please call (210) 684-1391 ext 222.

Bids must be submitted on the furnished bid form furnished and submitted in a sealed envelope and shall be clearly endorsed "**LEON VALLEY PUBLIC LIBRARY CHILDREN'S WING**". Each bid shall be accompanied by a bid guarantee in the form of a certified check, cashier's check, or bid bond in the amount of five percent (5%) of the total bid price. Any bid received after closing time will be returned unopened.

The successful bidder will be required to furnish a one hundred percent (100%) Performance Bond and a one hundred percent (100%) Payment Bond.

The City of Leon Valley reserves the right to reject any and all bids, to award the contract in what it deems is in its best interest and to waive any informality or technicality in the bid.

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Section not in Contract

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Section not in Contract

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See Struct. Sht. S-3.1 for additional notes

Division 14 - Conveying Systems

Section not in Contract

See civil, mechanical, electrical, plumbing specifications.  
 Structural specifications notes are included on structural drawings.  
 Landscape specification notes are included on landscape drawings.

**BID FORM**

BID OF: \_\_\_\_\_  
(Name of Bidder)

NAME OF PROJECT:

**LEON VALLEY PUBLIC LIBRARY CHILDREN'S WING**

Dear Sirs:

The undersigned, having examined the Drawings, Specifications and related documents, the site and premises of the proposed work, being familiar with all of the conditions relating to the construction for the proposed project, including the availability of materials and labor, hereby propose to furnish all labor, materials, services and equipment required in connection with or required for the construction of the building, including all addenda and in strict conformance with the following Specifications and Drawings:

Specification Sections: Bidding Documents; AIA General Conditions of the Contract for Construction (AIA Document A201); Supplementary Conditions; Division 1 through 16, as indexed in the forepart of the Specifications.

Prepared by Richard Mogas & Associates, Inc.  
317 Lexington, Suite 4, San Antonio, TX 78215, Phone: 210-266-2220 Fax: 210-226-1846  
mogasarch@juno.com

Bidder acknowledges receipt of the following addenda (if any): \_\_\_\_\_

Bid: \_\_\_\_\_

DOLLARS (\$ \_\_\_\_\_)

Additive Alternate No.1

Light Monitor ONLY Bid: \_\_\_\_\_

DOLLARS (\$ \_\_\_\_\_)

Amounts are to be shown in both words and numeric figures. In case of discrepancy, the amount shown in words will govern.

Submit a certificate of insurance for workers compensation or a certificate of authority to self insure with bid.

**Time of Completion:**

No. of Calendar Days to complete the Project: \_\_\_\_\_

The undersigned further agrees, if awarded the Contract, to complete all work as outlined by the Plans and Specifications within the number of calendar days indicated for in the Bid Form.

**Notification:**

The undersigned hereby notifies the Owner that he/she understands that the Owner reserves the right to reject any or all bids and to waive any informalities in the bidding, and to award the Contract in the best interest of the project.

For every day exceeding the number of stipulated construction days as stated in the Contractor's bid, the Contractor shall be charged \$250 per calendar day until the project is completed to the satisfaction of the Owner. Additionally, the City will retain ten percent (10%) of the total bid amount, which will be paid within thirty (30) days of Owner satisfied completion.

It is understood that all bidding documents become a part of the Contract Documents upon signing of the contract. Failure to comply with any part of this bid will be taken as failure to comply with said Contract and will be just cause for rejection of the work.

I agree to perform all the work described in the BID for the preceding prices.

Respectfully Submitted,

\_\_\_\_\_  
(Legal Name of Corporation):

\_\_\_\_\_  
(Legal Name of Bidding Firm)

\_\_\_\_\_  
(State of Incorporation):

\_\_\_\_\_  
(Address)

\_\_\_\_\_  
(Type Name of Officer):

\_\_\_\_\_  
(Type Name of Officer)

\_\_\_\_\_  
(Signature of Officer):

\_\_\_\_\_  
(Signature of Officer)

\_\_\_\_\_  
(Title of Officer):

\_\_\_\_\_  
(Title of Officer)

\_\_\_\_\_  
(Date):

\_\_\_\_\_  
(Date)

**SPECIAL INSTRUCTIONS**

Please submit one hard copy and one electronic version of your bid. The electronic version must be "pdf" format and be provided on CD/DVD media or on a removable flash drive. A searchable "pdf" is preferred but not required for this bid.

\_\_\_\_\_  
(Legal Name Witness):

\_\_\_\_\_  
(Address of Witness):

\_\_\_\_\_  
(Signature of Witness):

\_\_\_\_\_  
(Address of Witness):

\_\_\_\_\_  
(Date):

Seal of Corporation:

Note: To be valid, signature of Bidder, including Corporation Bidder, must be witnessed and the bid dated.

**BID BOND****BIDDER** (Name and Address): \_\_\_\_\_\_\_\_\_\_  
\_\_\_\_\_**SURETY** (Name and of Principal Place of Business): \_\_\_\_\_\_\_\_\_\_  
\_\_\_\_\_**OWNER** City of Leon Valley  
6400 El Verde Road  
Leon Valley, TX 78238**BID** Bid Due Date: 10:00 a.m., Friday, August 31, 2012  
Project: LEON VALLEY PUBLIC LIBRARY CHILDREN'S WING**BOND** Bond Amount: 5% of the total bid price.

Bond Number: \_\_\_\_\_

Date (Not later than Bid due date): \_\_\_\_\_

Penal Sum: \_\_\_\_\_

(Words)

(Figures)

IN WITNESS WHEREOF, Surety and Bidder, intending to be legally bound hereby, subject to the terms printed on the reverse side hereof, do each cause this Bid Bond to be duly executed on its behalf by its authorized officer, agent, or representative.

**BIDDER****SURETY**\_\_\_\_\_  
Bidder's Name and Corporate Seal (Seal)\_\_\_\_\_  
Surety's Name and Corporate Seal (Seal)By: \_\_\_\_\_  
Signature and TitleBy: \_\_\_\_\_  
Signature and Title (Attach Power of Attorney)Attest: \_\_\_\_\_  
Signature and TitleAttest: \_\_\_\_\_  
Signature and Title

Note: (1) Above addresses are to be used for giving required notice.  
(2) Any singular reference to Bidder, Surety, OWNER or other party shall be considered plural where applicable.

1. Bidder and Surety, jointly and severally, bind themselves, their heirs, executors, administrators, successors and assigns to pay to OWNER upon default of Bidder the penal sum set forth on the face of this Bond.

2. Default of Bidder shall occur upon the failure of Bidder to deliver within the time required by the Bidding Documents (or any extension thereof agreed to in writing by OWNER) the executed Agreement required by the Bidding Documents and any performance and payment Bonds required by the Bidding Documents.

3. This obligation shall be null and void if:

3.1. OWNER accepts Bidder's Bid and Bidder delivers within the time required by the Bidding Documents (or any extension thereof agreed to in writing by OWNER) the executed Agreement required by the bidding Documents and any performance and payment Bonds required by the Bidding Documents, or

3.2. All Bids are rejected by OWNER, or  
3.3. OWNER fails to issue a Notice of Award to Bidder within the time specified in the Bidding Documents (or any extension thereof agreed to in writing by Bidder and, if applicable, consented to by Surety when required by paragraph 5 hereof).

4. Payment under this Bond will be due and payable upon default by Bidder and within 30 calendar days after receipt by Bidder and Surety of written notice of default from OWNER, which notice will be given with reasonable promptness, identifying this Bond and the Project and including a statement of the amount due.

5. Surety waives notice of and any and all defenses based on or arising out of any time extension to issue Notice of Award agreed to in writing by OWNER and Bidder, provided that the total time for issuing Notice of Award including extensions shall not in the aggregate exceed 120 days from Bid due date without Surety's written consent.

6. No suit or action shall be commenced under this Bond prior to 30 calendar days after the notice of default required in paragraph 4 above is received by Bidder and Surety and in no case later than one year after Bid due date.

7. Any suit or action under this Bond shall be commenced only in a court of competent jurisdiction located in the state in which the Project is located.

8. Notices required hereunder shall be in writing and sent to Bidder and Surety at their respective addresses shown on the face of this Bond. Such notices may be sent by personal delivery, commercial courier or by United States Registered or Certified Mail, return receipt requested, postage pre-paid, and shall be deemed to be effective upon receipt by the party concerned.

9. Surety shall cause to be attached to this Bond a current and effective Power or Attorney evidencing the authority of the officer, agent or representative who executed this Bond on behalf of Surety to execute, seal and deliver such Bond and bind the Surety thereby.

10. This Bond is intended to conform to all applicable statutory requirements. Any applicable requirement of any applicable statute that has been omitted from this Bond shall be deemed to be included herein as if set forth at length. If any provision of this Bond conflicts with any applicable statute, then the provision of said statute shall govern and the remainder of this Bond that is not in conflict therewith shall continue in full force and effect.

11. The term "Bid" as used herein includes a Bid, offer or proposal as applicable.

## **SCOPE OF WORK**

The Scope of Work entails the construction of a new 1-story building addition. It includes, but is not limited to, site work, concrete, metals, carpentry, built-up roofing, metal roofing, insulation, sealants, aluminum windows, glazing, aluminum doors, wood doors, hardware, drywall, painting/sealers, specialties, HVAC, electrical, lighting, plumbing, landscaping, irrigation, etc...

### Schedule

General Contractor will be required to provide the number of calendar days required to complete the project from the date of issuance of the building permit.

### Liquidating Damages:

For every day exceeding the number of stipulated construction days as stated in the Contractor's bid, the Contractor shall be charged \$250 per calendar day until the project is completed to the satisfaction of the Owner. Additionally, the City will retain ten percent (10%) of the total bid amount, which will be paid within thirty (30) days of Owner satisfied completion.

### Prime Contract

All work, including general construction, mechanical and electrical work will be awarded under a single prime contract.

### AIA Documents

AIA documents identified in this bid are copyright protected therefore they are not included. AIA documents are available directly from the AIA or may be viewed in the Office of the Purchasing Agent, 6400 El Verde Road, Leon Valley, TX 78238. If you wish to view these documents, please call (210) 684-1391 ext. 222.

## **END OF SECTION**

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## **END OF SECTION**

## **GENERAL REQUIREMENTS**

- 1.1 The "General Conditions of the Contract for Construction", A.I.A. Document A201, 2007 Edition, is a part of this Contract.
- 1.2 The Contractor and Subcontractor are responsible for verifying all dimensions and conditions incidental to this work and taking site measurements for all items requiring fitting to work previously built or set.
- 1.3 Contractor is responsible for carefully inspecting work completed and verifying its accuracy and quality before subsequent work is commenced. If problems exist, contact Architect before starting work.
- 1.4 Contractor is responsible for installing all materials and equipment according to the manufacturer's recommendations. At least one qualified person who is familiar with the proper procedure and manufacturer's requirements shall be present during installation.
- 1.5 The Contractor shall remove and replace all defective work at his own expense.
- 1.6 The Contractor shall haul, stack and store all materials as is proper for their kind to protect them at all times.
- 1.7 The Contractor is responsible for hauling away trash, debris and surplus building materials.
- 1.8 Approval of shop drawings does not remove Contractor's responsibility for quantities, measurements, etc.
- 1.9 The Contractor shall guarantee the work under this contract for one (1) year from final acceptance date against defects in materials, equipment and workmanship and shall repair or replace defects to the Owner's satisfaction at no cost to the Owner. With the request for final payment, Contractor shall deliver to Owner all warranties and guarantees which extend beyond his own.
- 1.10 Project Closeout: The Contract will be considered fulfilled when all work has been completed; the final inspection made by Owner and Architect and final acceptance and final payment by the Owner. When the Architect and Owner determine that all work is substantially complete, they will prepare a punch list to give to the Contractor so he can make any adjustments or corrections as required to complete the project. The failure to include any items on such list does not alter the Contractor's responsibility to complete all work according to drawings and specifications.

## **END OF SECTION**

## **SUPPLEMENTAL GENERAL CONDITIONS**

The General Conditions of this Contract are the American Institute of Architect's Document A-201, "General Conditions of the Contract for Construction", View [www.AIA.ORG](http://www.AIA.ORG) which is hereby made a part of these Specifications and shall apply to all contractors and subcontractors.

In event Document A201 is not bound herewith, a copy may be referred to or obtained from the office of the Architect.

### **THE SUPPLEMENTAL GENERAL CONDITIONS**

The Supplemental General Conditions contain changes and additions to the AIA General Conditions. Where any part of the AIA General Conditions is modified or deleted by these Supplemental General Conditions, the unaltered provisions shall remain in effect.

### **MODIFICATIONS TO THE VARIOUS ARTICLES OF THE GENERAL CONDITIONS:**

#### **ARTICLE 1 - GENERAL PROVISIONS**

- 1.1 Basic Definitions: Add the following sentence to paragraph 1.1.1, THE CONTRACT DOCUMENTS: "The Agreement takes precedence over all other Contract Documents".
- 1.2 Execution, Correlation, and Intent: Add the following paragraphs:
  - 1.2.6 Titles of Sections and Articles in these specifications are introduced merely for convenience and are not to be construed as a correct or complete segregation or tabulation of the various units or materials and/or work. The Contractor shall be solely responsible for omissions or duplications by the Contractor or any Subcontractors due to real or alleged error, either direct or implied, in agreement of matter on the Contract Documents.
  - 1.2.7 Contractor shall check drawings and specifications immediately upon their receipt, and shall notify the Architect in

writing not later than Ten (10) days after receipt of them, of errors, discrepancies or omissions. Contractor shall verify dimensions and details before ordering materials or laying out work and shall be responsible for errors that might have been avoided by such check. Deviations from drawings and dimensions shall be made only with the Architect's permission.

- 1.2.8 Specifications and Drawings are intended to be complementary and in agreement with each other. All work or material called for by either shall be performed and/or furnished as if called for by both. In cases of discrepancy concerning dimensions, quantities and location, the Contractor shall in writing, call to the attention of the Architect any discrepancies between Specifications, Plans, Details or Schedules. The Architect will then inform the Contractor in writing which document takes precedence.

### ARTICLE 3 - CONTRACTOR

- 3.4 Labor and Materials: Add the following paragraph:

- 3.4.3 Contractor and Subcontractors shall conform to the labor laws of the State of Texas, and the various acts amendatory and supplementary thereto, and to all other laws, ordinances and legal requirements applicable thereto. Applicable Federal Laws shall be complied with.

- 3.6 Taxes: Add the following paragraph:

- 3.6.2 The Contractor shall pay all taxes and insurances required by the State and Federal Laws.

- 3.7 Permits, Fees and Notices: Add the following paragraph:

- 3.7.5 The City of Leon Valley shall wave all costs related to all permitting. Licenses, etc., required in the prosecution of the work, whether of a permanent or temporary nature shall be paid by the Contractor. Upon completion of the work the Contractor shall deliver to the Owner through the Architect all required certificates of inspection.

## **ARTICLE 5 - SUBCONTRACTORS**

5.1 Definitions: Add the following paragraph:

5.1.3 There shall be no obligation on the part of the Owner to pay or see to the payment of any sums due any Contractor or Subcontractor, nor create any obligation of any kind, express or implied, upon the Owner or the Architect in favor of any Subcontractor or Sub-subcontractor.

## **ARTICLE 6 - CONSTRUCTION BY OWNER OR BY SEPARATE CONTRACTORS**

6.2 Mutual Responsibility: Add the following paragraph:

6.2.7 The Contractor shall be responsible for the fitting of all work and for the coordination of the operation of all trades, other Contractors, Subcontractors and material suppliers engaged upon or in connection with the work, as well as those of his own employees and he shall exercise every effort to assure a harmonious cooperative effort on the part of all those concerned. He shall be prepared to guarantee to each of his subcontractors and foremen all of the dimensions which they may require for the fitting of their own work to adjoining work and shall do or cause to do, all fittings and adjusting necessary to make the several parts of the work come together properly and fit the work to receive or be received by the work of other Contractors.

## **ARTICLE 7 - CHANGES IN THE WORK**

7.3 Construction Change Directives

7.3.6 A "reasonable allowance for overhead and profit" as referred to in the first sentence of this paragraph shall not exceed fifteen percent (15%).

## **ARTICLE 9 - PAYMENTS AND COMPLETION**

9.5 Decisions to Withhold Certification: Add the following paragraph:

9.5.1 The Architect will not issue any Certificates of Payment for any progress payment to the Contractor subsequent to the work completion date specified in Article 3 of the AIA Document A101, "Standard Form of Agreement Between Owner and Contractor", 1987 Edition.

9.6 Progress Payments: Delete in its entirety 9.6.1 and add the following paragraph:

9.6.1 After the Architect has issued a Certificate of Payment, and unless otherwise provided in the Agreement, the Owner shall make payment on account of Contract on or about the Fifteenth (15th) day of each month as follows:

- a. Prior to application for first payment, file with the Architect a complete schedule on AIA Documents G702 "Application and Certificate for Payment and G702A "Continuation Sheet", showing the value of various portions of the work in detail. The Contractor, upon approval of the Architect, may use other formats in lieu of G702 & G702A as long as all information required is supplied.
- b. Contractor's Application for Payment shall be submitted on Documents G702 and G702A on or before the last day of each month, Ninety percent (90%) of the value based on the Contract prices of labor and materials suitably stored at the site thereof, or in a bonded warehouse up to the last day of that month, as estimated by the Architect, less the aggregate of previous payments. Upon approval of the Owner, the Contractor may make application on the middle and last day of each month.
- c. Final payment shall be due Thirty (30) days after acceptance as Substantial Completion of the work, provided the work be then fully completed, and the Contract fully performed. Contractor shall submit to the Architect a notarized statement stating that all bills for labor and materials have been paid in full.

**ARTICLE 11 - INSURANCE:**

**Each bid shall be accompanied by a bid guarantee in the form of a certified check, cashier's check, or bid bond in the amount of five percent (5%) of the total bid price.**

**The successful bidder will be required to furnish a one hundred percent (100%) Performance Bond and one hundred percent (100%) Payment Bond.**

**11.1 Workmen's Compensation and Employer's Liability Insurance**

- 11.1.1 For the duration of this Contract, the Contractor shall maintain Statutory Workmen's Compensation and shall maintain Employer's Liability Insurance with minimum limits of not less than \$100,000.00. Contractor shall require Subcontractors to provide workmen's Compensation and Employer's Liability Insurance with the same minimum limits.

**11.2 Comprehensive General Liability Insurance**

- 11.2.1 For the duration of this Contract, the Contractor shall maintain comprehensive General Liability Insurance with Minimum Bodily Injury limits of not less than \$500,000.00 for each person and not less than \$500,000.00 for each accident. He shall maintain Property Damage Insurance with minimum limits of not less than \$500,000.00 for each accident and not less than \$500,000.00 aggregate. In addition, the Contractor shall maintain in force an Umbrella Liability Policy covering Bodily Injury and Property Damage in the amount of not less than \$500,000.00. Each policy shall include contractor's Protective Liability Insurance with the same minimum limits and completed operations coverage.

**11.4 Owner's Liability Insurance**

- 11.4.1 For the duration of this Contract, the Contractor shall purchase and maintain insurance described in paragraphs 11.2.1 in the minimum amount of the cost of construction and for the Owner's Liability and shall contain the same specific endorsements which the Contractor places on the insurance required by paragraphs 11.2.1.

## 11.5 All Risk Builders' Risk

- 11.5.1 For the duration of this Contract, the Contractor shall maintain an All Risk Builder's Risk Policy including collapse endorsements up to 100% of the insurable value of the work. This insurance shall include the interest of the Contractor, Subcontractors and the Owner. Form of policy used shall be Builder's Risk.

## 11.6 General Insurance Requirements

- 11.6.1 The Contractor shall not commence work at the site under this Contract until he has obtained all the required insurance and until such insurance has been approved by the Owner and the Architect. Contractor shall not allow any Subcontractor to commence work until all similar required insurance has been obtained and approved. Approval of insurance by the Owner and the Architect shall not relieve or decrease the liability of the Contractor hereunder.
- 11.6.2 Certificates of Insurance shall be filed with the Owner and the Architect prior to commencing the work. Failure to furnish either satisfactory insurance or the required certificates within Ten (10) days of Notice to Proceed shall not be considered cause for modification of any contractual time limits.
- 11.6.3 The required insurance must be written by a company licensed to do business in Texas at the time policy is issued. In addition the Company must be acceptable to the Owner.
- 11.6.4 The Contractor shall not cause any insurance to be cancelled or permit any insurance to lapse. All insurance policies shall include a clause to the effect that the policy shall not be cancelled or reduced, restricted or limited until Fifteen (15) days after the Owner has received written notice as evidenced by return receipt of registered or certified letter.
- 11.6.5 Certificates of Insurance shall contain transcripts from the proper Officer of the Insurer, evidencing in particular those insured, the extent of the insurance, the location and the

operations in which the insurance applies, the expiration date and the above mentioned Notice of Cancellation Clause.

## **ARTICLE 12 - UNCOVERING AND CORRECTION OF WORK**

12.2 Correction of Work: Add the following paragraph:

12.2.7 The Contractor shall furnish the Owner with a written guarantee against defective material and workmanship for a period of ONE YEAR from the date of FINAL ACCEPTANCE OF THE WORK. He shall secure all written guarantees and warranties called for in the specification. The Contractor is responsible for the guarantee on the entire work performed under this agreement with the Owner. Where guarantees are specified in any section of the specifications for longer periods, such longer periods shall apply.

## **ARTICLE 14 - TERMINATION OR SUSPENSION OF THE CONTRACT**

14.2 Termination by the Owner for Cause: Add the following sentence:

14.2.4 The cost incurred by the Owner as herein provided and damage incurred through the Contractor's default shall be certified by the Architect, and his findings shall be prima facie evidence as to the facts of such damage and expense.

**END OF SECTION**

## **SECTION 01000**

### **SPECIAL CONDITIONS**

#### **DIVISION 1 - GENERAL REQUIREMENTS**

##### **Part 1 - Site**

- 1.1 This property is located in Leon Valley (Bexar County), Texas.
- 1.2 The Contractor should familiarize himself with the site including topography, utilities, trees to remain and all other conditions that may affect the project. For new construction the Contractor shall "stake" the project with the Architect's approval before commencing work. Any discrepancies from the site drawings should be brought to the immediate attention of the Architect.

##### **Part 2 - Summary of the Work**

- 2.1 Work under the Contract: The Contractor shall supply all labor and materials, transportation, apparatus, light, energy, scaffolding, and tools necessary for the proper execution and completion of the work. He shall install, maintain and be responsible for the safe, proper and lawful maintenance and use of the same. Construct in the best and most workmanlike manner the complete project and everything properly incidental thereto as shown on the drawings, stated in the specifications or reasonably implied therefrom, and in accordance with the Contract documents. This contract includes Structural, Mechanical and Electrical Work.

##### **Part 3 - Construction Procedures**

- 3.1 The use of insufficient labor or equipment for construction purposes or inadequate scheduling of materials or equipment to be installed will not be allowed as the cause for delay. Labor, materials, and equipment shall be scheduled to the site in such quantities as required for the uninterrupted progress of the work and the least obstruction of the premises. No extension of time or extra cost will be allowed for failure by the Contractor to order on time in sufficient quantities.

- 3.2 Protect finished work: Cover and protect finished floors, steps, treads, etc., against damage by workmen, equipment, etc., during the work. Wherever concrete, paint, cement, equipment, etc., are hoisted or carried into the building, the brick walls, aluminum work, windows, etc., adjacent to the hoisting must be covered with a heavy layer of building paper, and floors and steps over which any material is carried must be well covered to protect all work against damage.
- 3.3 Measurements: Before ordering any material or starting any work each Contractor shall verify all measurements at the building and shall be responsible for the correctness of same. No exchange or compensation will be allowed on account of difference between actual dimensions and measurements indicated on the drawings. Any difference which may be found shall be submitted to the Architect for instructions before proceeding with the work.

#### **Part 4 - Compliance with Ordinances and Public Safety**

- 4.1 The Contractor shall secure and pay for all necessary permits and shall comply with ordinances pertaining to the work. He shall provide and maintain temporary walkways, where needed, fences and other structures required by Federal and State Regulations and Local Ordinances in such manner as not to interfere with traffic in public streets. He shall leave access to fire hydrants and protect public and adjacent property at all times during the progress of the work. The proper signs shall be posted at all truck entrances, and all other proper safety precautions observed. Contractor shall comply with all applicable provisions of the National Occupational Safety and Health Act (NOSHA), 1970. Contractor will be held liable for damage to property or persons.

#### **Part 5 - Materials and Equipment**

- 5.1 Materials and Workmanship: Unless specified to the contrary, all materials of construction shall be new and of best grade and kinds specified, and all workmanship shall be of the best recognized standards known to the various trades.
- 5.2 Transportation and Handling: Methods of crating, transportation and handling of materials and equipment, on or off the site, shall be such as to assure their ultimate installation is undamaged and in perfect working condition.
- 5.3 Storage and Protection: Provide weather protection of the work, materials and equipment, whether incorporated in the building or not. Cover building openings to protect interior from weather when necessary. Provide absolute watertight protection at all times.

### **Part 6 - Separate Contracts**

- 6.1 Although it is contemplated that this Contract shall include all the work to be done at this time, it is possible that the Owner may let other contracts in connection with the work herein specified. In the event, the Owner reserves the right to do so, in which case the Contractor will afford reasonable opportunity for the storage of materials and execution of the work done by others.

### **Part 7 - Scaffolds and Runways**

- 7.1 The Contractor shall furnish and erect and maintain for the duration of the Contract as required, all scaffolds, runways, guard-rails and forms and similar temporary construction as may be necessary for the performance of the Contract. Such facilities shall be of type and arrangement as required for their specific use; shall be substantially constructed throughout, strongly supported and well secured and shall comply with all applicable rules and regulations of Federal, State and Local Codes. The several levels of the structure shall be connected by means of suitable ladders, ramps and temporary stairs; provided however that the permanent stairways may be used for such purposes if adequately protected against damage. Open halls and shafts shall be enclosed as required by the Department of Public Safety.

**END OF SECTION**

**SECTION 01300****SUBMITTALS****1. Standards:**

Reference in these specifications to any article, device, product, materials, fixture, form or type of construction, etc., by proprietary name, make or catalog number, shall be interpreted as establishing a standard of quality and shall not be construed as limiting competition. All materials, supplies and articles furnished shall be the standard products of recognized reputable manufacturers.

**2. Substitutions:**

Should the Contractor desire to substitute any equal material or brand or manufacturer other than that specified, he shall, within seven (7) days after the Contract is awarded, submit to the Architect a written request for approval of all the substitutions he wishes to make. Such requests shall be accompanied, if feasible, by samples of each material proposed as a substitute. In all instances, such requests shall be accompanied by complete descriptive literature and performance data. The Architect will investigate all such requests and render written decisions thereon as promptly as is reasonably possible, and such decisions shall be final.

**3. Shop Drawings:**

Shop drawings of all trades shall be submitted only by the General Contractor, who shall indicate by signed stamp on each sheet of the drawings that the work shown is in accordance with the Contract requirements and has been checked for dimensions, quantities, and relationship with work of all trades involved. Any shop drawings submitted without the General Contractor's signed stamp thereon will be returned unchecked. The Architect's checking of shop drawings shall be for design and general conformity only. Shop drawings shall be required only on items requiring special construction.

**END OF SECTION**

**SECTION 01341****STRUCTURAL ENGINEER: SHOP DRAWINGS AND FIELD VISITS****PART 1 - GENERAL****1.1 RELATED DOCUMENTS**

Construction drawings and the general provisions of the Contract.

**1.2 SCOPE**

This section describes specific items of Article 4 of the Contract that are peculiar to the responsibility of the structural engineer.

**PART 2 - DEFINITIONS****2.1 STRUCTURAL ENGINEER OF RECORD**

The engineer responsible for the design of the primary structural system and whose seal and signature appears on the contract structural drawings. The responsibility for any secondary structural and non-structural systems not shown on the contract structural documents rests with the prime professional, the architect.

**2.2 SPECIALTY ENGINEER**

The engineer who is licensed in the state in which the project is being constructed to seal plans and designs for pre-engineered elements and systems which will become part of the overall building.

**2.3 SUBMITTALS**

Items identified in the contract documents to be submitted by the contractor. Refer to individual sections of these specifications for specific items to be submitted.

**2.4 SITE VISITS**

Visits to the project jobsite by the structural engineer-of-record or his authorized representative to ascertain whether the work is generally in accordance with the contract structural documents. These observations are not exhaustive nor continuous.

**PART 3 - PROCEDURES****3.1 SUBMITTALS**

Refer to the Architect for specific requirements for number of copies to be submitted, time for review, etc. All submittals must come by way of the general contractor through the architect. Certain submittals, identified in specific sections of these specifications, generally regarding Pre-engineered elements, will require a specialty engineer's seal and Signature.

**3.2 SITE VISITS**

Structural engineer shall be notified at least 24 hours in advance of any action that will cover up structural elements that have not been observed by an authorized representative of the office of the structural engineer of record.

**3.3 ENGINEER'S ACTIONS****A. SUBMITTALS WITH SPECIALTY ENGINEER'S SEAL AND SIGNATURE**

Certain submittals may be identified in specific sections of these specifications pertaining to pre-engineered structural elements specified by the structural engineer-of-record and designed by the specialty engineers. Submittals shall bear the signature and seal of the specialty engineer responsible for the design as required by the contract documents. The structural engineer shall review the submittal for type, position, and connection to other elements of the primary structural system, and for criteria and loads used for their design.

**B. SHOP DRAWINGS**

In accordance with the General Conditions, the structural engineer of record will review shop drawings for the limited purpose of checking for general conformance with information given and the design concept expressed in the contract structural documents.

The structural engineer-of-record shall review each submittal and return them to the architect with one of the following statements checked off on the stamp.

1. "NO EXCEPTIONS TAKEN" informs the Architect that the structural engineer takes no exception to the submittal being approved as per and in accordance with AIA Document 201, section 4.2.7.

2. "MAKE CORRECTIONS NOTED" informs the Architect that the structural engineer has made corrections or comments on the submittals but otherwise takes no exception to the submittal being approved as per and in accordance with AIA Document 201, section 4.2.7.
3. "REVISE AND RESUBMIT" indicates important items must be corrected and resubmitted. Comments made on the submittal may not necessarily cover all of the defects of the submittal. This action constitutes the structural engineer's concern and his recommendation to the Architect that the submittal be reviewed and resubmitted as per and in accordance with AIA Document 201, section 4.2.7.
4. "RETURN ONE CORRECTED COPY FOR FILE" informs the Architect that the submittal may be approved as per AIA Document 201, section 4.2.7, but a single corrected copy showing that corrections have been acknowledged must be returned for the structural engineer's file.

### 3.4 VISITS TO THE PROJECT SITE

- A. The structural engineer-of-record ("SER") will make site visits at appropriate stages of construction and as defined by the contract to visually observe the quality and the progress of the construction work relative to the primary structural system. The general contractor is responsible to notify the SER when structural elements are ready for review and prior to their being covered up. Failure to do so may result in key observations not being made, preventing the engineer from recommending acceptance of the work. A written report will be made of each visit describing what was observed and listing discrepancies, if any. One copy will be given to contractor's representative at the jobsite, and one copy will be mailed to the office of the Architect. If a subsequent visit is necessary it will be so noted on the report.
- B. The SER shall not have control over or charge of and shall not be responsible for means and methods of construction, techniques, sequences or procedures, or for safety precautions and programs in connection with the Work for This Part of the Project. These are solely the Contractor's responsibility under the Contract for Construction. The SER shall not be responsible for the Contractor's or a Subcontractor's schedule or failure to carry out the Work in accordance with the Contract Documents. The SER shall not have control over or charge of acts or omissions of the Contractor, Subcontractors, their agents or employees or other persons performing portions of the Work.

END OF SECTION 01341

**SECTION 01400****QUALITY CONTROL****1. GENERAL:**

- 1.1 Unless specified otherwise in the Contract documents, testing laboratory services for Quality Control shall be conducted by a recognized independent testing agency selected by the Architect and paid for by the Owner.
- 1.2 In the event certain materials of construction do not measure up to the required standards or certain performance obligations are not met, the defective material and or work shall be removed and replaced at the contractor's expense and subsequent testing and related work necessitated by the replacement shall be paid by the Contractor and / or related Sub-contractor.
- 1.3 The laboratory shall submit detailed invoices, based on agreed unit prices, monthly to the Architect for payment.
- 1.4 Professional laboratory services shall include but not necessarily be limited to the following:
  - .1 Soil compaction
  - .2 Cast in place concrete, including making and testing of concrete cylinders during progress of the work, including related slump tests.
- 1.5 Testing and services by Contractor / Sub contractor and laboratories: Concrete mix designs.
- 1.6 Responsibilities of Contractor and/or Sub contractor regarding testing laboratory: Selection of the Laboratory by the Architect in no way relieves the Contractor and/or Sub contractor of his/their responsibility to furnish materials and construction in full compliance with the drawings and specifications.
- 1.7 Advise the selected laboratory sufficiently in advance of construction operations to allow laboratory to complete any required check tests and assign personnel for field inspection and testing as specified.
- 1.8 Provide adequate facilities for safe storage and proper curing of concrete test samples on project site for the first 24 hours and also for subsequent field curing required.
- 1.9 Authority and duties of laboratory personnel: Should it appear that the material furnished and/or work performed by the Contractor and/or Sub contractor fail to meet requirements of the Contract Documents, the

Laboratory Inspector shall direct the attention of the Contractor and the Architect to such failure and infringement.

- 1.10 The Laboratory Inspector is not authorized to revoke, alter, relax, enlarge or release any requirements of the drawings and specifications, or to approve or accept any portion of the work

- 1.11 Reports: The laboratory shall report to the Owner on each and every service rendered, with copies mailed as follows:

One (1) Copy to the Architect as directed.

Two (2) Copies to the Contractor as directed.

One (1) Copy to each related Engineer and/or Consultant as directed.

#### **END OF SECTION**

**SECTION 01500****TEMPORARY FACILITIES & CONTROL**

1. The Contractor shall provide a complete set of drawings and specifications on the job site, which shall remain until the full completion of the work.
2. **TEMPORARY UTILITIES:** The Contractor shall make all necessary arrangements and pay for all water and electric power as may be required during the period of construction for whatever purpose such service may be required and until such time as the construction is completed and accepted by the Owner. The Contractor will be required to pay for the providing and installations of all conduits, wires, switches, storage tanks, piping, valves, fittings, hose connections, safety devices, etc. necessary for this purpose and shall maintain the same in good condition throughout the period of their use and shall remove them upon completion of the work. Proper precautions shall be taken to prevent leaks, short circuits, etc. and any such defects which develop will be promptly and efficiently repaired.
3. **TEMPORARY HOISTS:** The Contractor shall install and operate all temporary hoists as his needs may require. The contractor shall erect such temporary stairs as may be required for his operations. The Contractor shall erect and maintain suitable handrails and toeboards around all openings in floors and roofs and wherever else required for proper safety precautions. All the foregoing requirements shall be constructed in accordance with the requirements of the Occupational Safety and Health Act of 1970.
4. **TEMPORARY HEAT:** The contractor shall provide and maintain temporary heat as required for the work during and throughout the entire period of construction to protect all work, materials and equipment against injuries from dampness and cold. The permanent heating system may be utilized for this purpose after installation. However, if so utilized, the contractor shall:
  - 4.1 Pay for all charges in conjunction with repairs and/or replacement to heating equipment and devices during his use of such equipment in order that heating equipment shall be turned over to the Owner in first class operating and equal to new condition with all filters and ductwork cleaned as necessary. If required replace filters.
  - 4.2 **Insurance:** Builder's Risk Insurance Policies shall be endorsed to permit the operation of permanently installed equipment (other than a testing basis) for temporary use by the Contractor or Owner.
  - 4.3 Temporary use of equipment shall in no manner effect warranties and guarantees. Warranty and Guarantee periods shall be effective from the date of acceptance of the equipment by the Owner.

5. TEMPORARY SANITARY FACILITIES: The Contractor shall furnish, install and maintain ample sanitary facilities for the use of his workmen and those of sub-contractors. Portable type facilities will be permitted. Sanitary facilities shall be furnished at the time work is commenced and shall be maintained in compliance with all applicable health laws and regulations and the use of such facilities shall be enforced. Mechanics and laborers in the employ of the Contractor and sub-contractors shall not be permitted to use other than the toilet facilities provided. Upon completion of the work the Contractor shall remove the temporary sanitary facilities and all traces thereof.
6. TEMPORARY ELECTRIC LIGHTING: The General Contractor shall provide for temporary electricity to be used for lighting within the building during construction work. Sufficient lighting shall be provided in rooms and areas where crafts or trades are working so that quality work performed will be in accordance with the acceptable standards of the trade.
7. CUTTING AND FITTING: Except as otherwise specified, each sub-contractor shall execute all cutting and fitting in his work that may be required by others so that the engagements between the various materials will be neat and proper. Cutting of any structural portions of the building shall not be permitted except as approved by the Architect. Each sub-contractor shall locate and provide sleeves, suitable to the Architect, for all holes, chases, openings or blockouts required for the installation of the work. All such openings shall be straight, true and of the proper size. No excessive cutting will be permitted. After the work has been installed, all openings shall be carefully fitted around as directed and to the satisfaction of the Architect.
8. LABOR: The Contractor and each sub-contractor shall comply with all applicable laws regulating the employment of labor.
9. PROGRESS MEETINGS: The contractor and selected sub-contractors shall meet at the building site or at some other designated meeting place at such intervals as necessary to maintain optimum degree of communication for the progress of the work.
10. SUPERVISION: Each sub-contractor shall designate some one person of its employ, having the responsibility and authority to act as so directed by the Contractor to accomplish the terms and conditions of the Agreement, Drawings and Specifications. The sub-contractor shall bear full responsibility for any delays caused by failure to comply with this requirement.
11. CLEANING: Each sub-contractor shall be responsible for leaving all finish surfaces cleaned and, where applicable, polished and left in perfect condition. All areas shall be broom cleaned and rubbish removed from the premises at completion of each phase of the work or as directed by the Contractor. The contractor shall promptly remove from the lot, sidewalks and streets all rubbish and dirt due to the work done under the contract. The Contractor shall provide and maintain suitable refuse cans for the use of workmen (lunch sacks, garbage, etc.).
12. FIRE PROTECTION: The Contractor and sub-contractors shall observe and the Contractor shall enforce throughout the work during the whole period of construction all requirements of

City Ordinances, State and Insurance Authorities, O.S.H.A., to minimize the fire hazards during the progress of the work.

**END OF SECTION**

**SECTION 01650****ALLOWANCES****1.0 SCOPE**

- 1.1 Cash Allowances are for materials only except where noted otherwise. Allowances include cost of delivery to the job site and all taxes paid.
- 1.2 Cash Allowances are hereby established for the time and in the amounts listed below. If any items exceed the amount listed, such excess cost shall be paid by the Owner. If any items cost less than the amount Contractor or Sub-Contractor(s) paid, whichever makes the direct purchase, the difference in cost shall be credited to the owner.

**2.0 ALLOWANCE ITEMS:**

2.1	<u>Item</u>	<u>Allowance</u>
A.	Contingency Allowance	\$ 10,000
B.	Furniture by owner. (Built-in computer stations in contract.)	
C.	Carpet Squares	\$ 30 per S Y
D.	Landscaping and Irrigation	\$ 8,000
E.	Security; Consult owner for coordination of "tie in" to existing library security system. This work is not in the scope of this project.	

**3.0**

Contractor to coordinate with Owner and Architect the selection of all items listed above.

**END OF SECTION**

**SECTION 01700****PROJECT CLOSEOUT**

1. **COMPLETION OF CONTRACT:** The contract will be considered fulfilled, save as provided in any maintenance stipulations, bond, or by law, when all the work has been completed, the final inspection made by the Final Inspection Team, and final acceptance and final payment by the Owner.
2. **USE PRIOR TO COMPLETION:** When in the opinion of the Architects any section or portion of the work is in suitable condition, it may be put into use upon the written order of the Architect, and such usage shall not be held in any way an acceptance of said work or any part thereof or as a waiver of any of the provisions of the Contract Documents pending final completion and acceptance of the work; all necessary repairs and removals of any portion of the work so put into use, due to defective materials or workmanship or to operations of the Contractor, shall be performed by the Contractor at his own expense.
3. **PROCEDURES AT COMPLETION:** When the Architects determine that all of the work is substantially complete the Architects will prepare and submit to the contractor a punch list of items to be completed or corrected prior to the final inspection. The failure to include any items on such list does not alter the responsibility of the Contractor to complete all work in accordance with the Contract Documents. After receiving the punch list from the Architects, the Contractor shall proceed immediately to correct the items thereon. When all items on the punch list have been corrected, the Contractor shall notify the Architects that the work is ready for final inspection.
4. **FINAL INSPECTION AND ACCEPTANCE:** When the work has been satisfactorily completed, including correction items contained on the punch list, and all detailed inspections and test requirements has been satisfied, the Contractor shall notify the Architects in writing to make the final inspection. Provided the work is ready for final inspection, such inspection will be commenced within ten (10) days after date of such notification, and will be completed as promptly as practicable. The final inspection will be made by the Final Inspection Team which shall include representatives of the Owner and the Architects. After final inspection, if the work is found to be satisfactory, notice of final acceptance by the Owner will be provided in writing by the Architects to the Contractor. If the work is found to be unacceptable at the time of the final inspection, the Architects will inform the Contractor of the particular defects that must be remedied before final acceptance will be made. Also at this time, the Owner may elect to advise the Contractor in writing that a conditional acceptance has been made. The conditional acceptance shall to the extent set forth therein relieve the Contractor of responsibility for the maintenance, security, and insurance on the work and shall also be used to establish the time of the work; in no case, however, will a conditional acceptance relieve the Contractor of the responsibility for performing all the work set forth in the Contract including the correction of

deficiencies noted at the time that the conditional acceptance is made; and the Owner shall be entitled to retain from the Contractor's payment an amount to commensurate with the work remaining to be accomplished.

5. **MAINTENANCE PROVISIONS FULFILLMENT:** Prior to the expiration of the specified maintenance period provided for in the Contract, the Architects will make a detailed inspection of the work and will advise the Contractor and his surety of the items that require correction. The Architects will make a subsequent inspection and if the corrections have been properly performed, the Architects will issue a letter of release on the maintenance stipulations to the Contractor and his surety. If for any reason the Contractor has not made the required corrections before the expiration of the maintenance period, the maintenance stipulations as provided for in the Contract shall remain in effect until the corrections have been properly performed and a letter of release issued.
6. **RECORD DRAWINGS:** As work progresses, the Contractor shall keep complete and accurate records of all changes or deviations from the Contract documents including drawings and specifications indicating the work as actually installed. All such changes shall be neatly and correctly shown on black-line prints of the Contract drawings affected or in the specifications with appropriate supplemental notes. This record set of prints of the drawings and specifications shall be kept at the job site.

**CERTIFICATION OF RECORD DRAWINGS** - At the completion of the work the contractor shall certify by endorsement thereof that each of the revised drawings is complete and accurate. Prior to the Contractor's application for final payment, and as a condition to its approval by the Owner, the Contractor shall deliver the certified record drawings, as specified above to the Owner, indexed and marked for each division of the work.

7. **MANUALS, PARTS, LISTS AND INSTRUCTIONS:** After the approval of selected equipment and materials, and prior to final acceptance, the Contractor shall submit to the Architects a minimum of two (2) copies of manuals, parts lists and instructions necessary for the operation and maintenance of such items.
  - 7.1 **Manual and Spare Parts Lists:** The Contractor shall submit manufacturer and vendor data, to include operating and maintenance manuals, operation instruction and parts lists, as required by the technical provisions. Technical adequacy of this data shall be subject to approval by the Architects.
  - 7.2 **Presentation of Data:** Wherever possible data shall be presented on 8-1/2" x 11" sheets. Foldouts will normally be limited to 11" x 17" sheets. Light sensitive reproduction techniques are acceptable provided finished pages are clear, legible, and not subject to fading.

NOTE: Caution and Warning indications shall be clearly identified.

- 7.3 Spare Parts Lists: A spare parts list shall be furnished which shall include those repair parts recommended by the manufacturer to assure efficient operation for one year's normal operation following expiration of the guaranty period.
8. REPORTS CERTIFICATED AND SPECIAL GUARANTEES: The Contractor shall submit, prior to final payment, reports, certificates and special guarantees required by the Contract Documents.
- The Contractor shall and hereby does warrant and/or guarantee all work for a period of one (1) year from the date of completion, as evidenced by the date of final acceptance of this work. This provision shall not be considered as conflicting with stated guarantees for longer periods. The guarantees imply and require that faulty materials, workmanship and/or errors be promptly corrected by the Contractor without cost to the Owner.
9. PERIODIC AND FINAL PAYMENTS: Shall be in accordance with the terms of the Contract.

**END OF SECTION**

## SECTION 02010 - SUBSURFACE CONDITIONS

### PART 1 - GENERAL

#### 1.1 GENERAL

An independent Geotechnical Consultant and Testing Laboratory has been employed by the owner to perform a soil and foundation investigation for this Project Site. A report of their findings is available for examination at the Architect's Office.

#### 1.2 REPORT CONTENTS

- A. The information and recommendations contained in the soils report were obtained by the Owner only for the use of the Architect and the Structural Engineer in the design and preparation of the Contract Documents for this Project. This report is not intended to be used for any other purposes.
- B. The report is not a warranty of subsurface conditions at the Project site.
- C. Bidders are encouraged to visit the Project site and acquaint themselves with all existing conditions prior to bidding. Bidders may, at their own expense, perform additional subsurface investigations; however, all such investigations must be performed under arrangements approved in advance by the Architect.

#### 1.3 TESTING AND INSPECTIONS

Refer to Section 02224 Foundation Earthwork for Buildings.

END OF SECTION 02010

**SECTION 02100****SITE PREPARATION****PREFACE**

The general provisions of the Contract, including the Conditions of the Contract (General, Supplementary and other Conditions) and Division 1 as appropriate, apply to the Work specified in this Section.

**1.0 SCOPE**

- 1.1 This Section covers the removal of sections of existing asphalt and concrete curb as indicated on plans, vegetation; topsoil stripping; clearing and grubbing; removing above-grade improvements; removing below-grade improvements.

1.2 Project Conditions

Traffic: Conduct site clearing operations to ensure minimum interference with roads, walks, and other adjacent occupied or used facilities. Do not obstruct streets, walks or other occupied or used facilities without permission from authorities having jurisdiction.

Protect improvements on adjoining properties and on Owner's property.

1.3 Existing Services

Arrange and pay for disconnecting, removing, capping and plugging utility services. Notify affected utility companies in advance and obtain approval before starting this work.

1.4 Site Clearing

Remove trees, shrubs, grass and other vegetation, improvements, or obstructions, as required to permit installation of new construction. Removing abandoned underground piping or conduits interfering with construction is included under this section.

1.5 Disposal of Waste Materials

Burning on Owner's Property is not permitted.

Remove waste materials and unsuitable or excess topsoil from Owner's Property.

**END OF SECTION**

## **SECTION 02221**

### **REMOVING EXISTING PAVEMENT AND STRUCTURES**

#### **PART 1 GENERAL**

##### **1.01 SECTION INCLUDES**

- A. Removing asphalt paving and portion of concrete curb.

##### **1.02 REGULATORY REQUIREMENTS**

- A. Conform to applicable codes for disposal of debris.
- B. Coordinate removal work with utility companies.

#### **PART 2 PRODUCTS – NOT USED**

#### **PART 3 EXECUTION**

##### **3.01 PREPARATION**

- A. Obtain advance approval from Project Manager for dimensions and limits of removal work.
- B. Identify known utilities below grade. Stake and flag locations.

##### **3.02 PROTECTION**

- A. Protect following from damage or displacement:
  - 1. Adjacent public and private property.
  - 2. Trees, plants, and other landscape features designated to remain.
  - 3. Utilities designated to remain.
  - 4. Pavement and utility structures designated to remain.
  - 5. Bench marks, monuments, and existing structures designated to remain.

##### **3.03 REMOVALS**

- A. Remove pavements and structures by methods that will not damage underground utilities. Do not use drop hammer near existing underground utilities.
- B. Minimize amount of earth loaded during removal operations.
- C. Where existing pavement is to remain, make straight saw cuts in existing pavement to provide clean breaks prior to removal.

- D. Where new curb connects to existing portions of remaining curb, provide an 1/2" compressible filler material between face cut of existing curb and new curb face.

#### **3.04 BACKFILL**

- A. Backfill of removal areas shall be in accordance with jurisdictional standards.

#### **3.05 DISPOSAL**

- A. Remove from site, debris resulting from work under this section in accordance with jurisdictional standards.

**END OF SECTION**

## SECTION 02224 - FOUNDATION EARTHWORK FOR BUILDINGS

### 1.1 RELATED DOCUMENTS

Construction drawings and general provisions of the contract, including General and Supplementary Conditions and Division-1 Specification sections, apply to work of this section of these specifications.

### 1.2 RELATED WORK SPECIFIED ELSEWHERE

A. Site Clearing Section 02110

### 1.3 DESCRIPTION OF WORK

#### A. DEFINITIONS

1. "Excavation" consists of removal of all material encountered to subgrade elevations indicated and subsequent, proper disposal of material removed.
2. "Building" shall include any attached walkway or other foundations shown on the contract structural drawings.

#### B. EXTENT OF WORK

Earthwork in this section is limited to the requirements of construction of the building foundation.

#### C. MECHANICAL/ELECTRICAL WORK EXCAVATIONS

Excavation and backfill required in conjunction with underground mechanical and electrical utilities, and buried mechanical and electrical utilities, and buried mechanical and electrical appurtenances is specified elsewhere.

### 1.4 QUALITY CONTROL

The contractor shall employ, at his expense, a commercial construction testing laboratory to perform soil testing and inspection service for quality control during earthwork operations, as specified elsewhere. The laboratory shall be the original Project Geotechnical Engineer or an alternate approved by the Structural Engineer.

## 1.5 SUBMITTALS

### TEST REPORTS-EXCAVATING

Submit the following reports directly to Architect/Engineer from the testing laboratory, with copies to Contractor:

- A. Verification of specified depth of excavation.
- B. Field density test reports, as follows:
  - 1. One optimum moisture-maximum density curve for each type of soil encountered.
  - 2. Report of actual unconfined compressive strength and/or results of bearing tests of each strata tested.

## PART 2 - PRODUCTS

### 2.1 SELECT FILL MATERIAL

Refer to contract drawings.

## PART 3 - EXECUTION

### 3.1 EXCAVATIONS

#### A. EXCAVATION

Refer to contract drawings.

#### B. UNCLASSIFIED EXCAVATION

Excavation is unclassified, and includes excavation to subgrade elevations indicated, regardless of character of materials and obstructions encountered.

#### C. UNAUTHORIZED EXCAVATION

- 1. Unauthorized excavation consists of removal of materials beyond indicated subgrade elevations or dimensions without specific

direction of Architect/Engineer. Unauthorized excavation, as well as remedial work directed by Architect, shall be at the Contractor's expense.

2. Earthwork described above shall be performed before trenching for grade beams and mechanical lines.

### 3.2 DE-WATERING

- A. Contractor shall implement a plan to prevent surface water and subsurface or ground water from flowing into excavations and from flooding building site and surrounding area.
- B. Establish and maintain temporary drainage ditches and other diversions outside excavation limits to convey rain water and water removed from excavations to run-off areas. Trench excavations shall not be used as temporary drainage ditches.
- C. Water shall not be allowed to accumulate in excavations. Remove water to prevent softening of foundation bottoms, undercutting footings, and soil changes detrimental to stability or subgrades and foundation. Provide and maintain pumps, well points, sumps, suction and discharge lines, and other de-watering system components necessary to convey water away from excavations.

### 3.3 PROOF ROLLING OF SUBGRADE

After initial excavation of surface soils, the exposed subgrade shall be proof rolled to locate density weak and compressible zones utilizing a 15 ton piece of equipment. Any soft spots identified shall be removed and replaced with select fill compacted as specified herein.

### 3.4 COMPACTION

Refer to contract drawings.

### 3.5 QUALITY CONTROL

- A. Testing laboratory shall be allowed to inspect and approve subgrades and fill layers before further construction work is performed.

- B. Field density tests shall be in accordance with ASTM D698.

### 3.6 TESTING OF SUBGRADE AND COMPACTED FILL

- A. If, in opinion of the testing laboratory and/or the Architect/Engineer, based on testing service reports and inspection, subgrade or fills which have been placed are below specified density, the contractor shall perform additional compaction and testing at no additional expense to the owner.

### 3.7 MAINTENANCE

- A. Protect newly graded areas from traffic and erosion.
- B. Keep area free of trash and debris.

### 3.8 RECONDITIONING COMPACTED AREAS

Completed compacted areas which are disturbed by subsequent construction operations or adverse weather, shall be scarified, re-shaped, and compacted to specified densities prior to further construction.

### 3.9 DISPOSAL OF EXCESS AND WASTE MATERIALS

All waste materials, including unacceptable excavated material, trash and debris, and shall be disposed off the Owner's property.

END OF SECTION 02224

**SECTION 02230****SITE CLEARING****PART 1 - GENERAL****1.1 SCOPE**

- A. Perform all work required to complete the project as indicated by the Contract Documents, and furnish all supplementary items necessary for the completion of all work specified in this Section.
- B. Completely coordinate with work of all other trades.
- C. Although such work is not specifically indicated, furnish and install all supplementary or miscellaneous items, appurtenances and devices incidental to or necessary for a sound, secure and complete installation. Also included in this section: the preparation of the storm water pollution prevention plan; completion of the "Notice of Intent"; submittal of the "Notice of Intent" per the Environmental Protection Agency (EPA) requirements; installation of the erosion control devices per the erosion control plan.

**1.2 RELATED WORK SPECIFIED ELSEWHERE**

- A. Section 02210 - Site Earthwork
- B. Section 02920 - Topsoiling and Finished Grading

**1.3 QUALITY ASSURANCE**

- A. Perform work in accord with OSHA and EPA requirements and state and local requirements.

**PART 2 - EXECUTION****2.1 SUBMITTALS**

- A. Complete EPA "Notice of Intent" and submit per the EPA requirements.

**2.2 PROTECTION**

- A. Provide barricades, coverings, and other protection necessary to prevent damage to existing improvements to remain.
  - 1. Protect improvements on adjoining properties as well as those on Owner's property.
  - 2. Restore improvements damaged by this work to original condition, as acceptable to Owner, other parties, and authorities having jurisdiction.
- B. Protect existing vegetation, including trees, to remain against damage.
- C. Repair or replace vegetation, including trees, damaged by construction operations.

**2.3 IMPROVEMENTS ON ADJOINING PROPERTY:**

- A. Owner will obtain authority for performing removal and alteration work, if any, on adjoining property.

**2.4 SITE CLEARING - GENERAL**

- A. Install Erosion Control Devices
- B. Remove vegetation, improvements, or obstructions that interfere with new construction.
  - 1. Removal includes stumps of the trees and their roots.
  - 2. Removal includes all structures that interfere with new construction to a depth of two feet below finished grade.
  - 3. All open structures below grade, shall be filled to finish grade. Backfill of open structures shall meet the requirements as specified in Section 02210.
- C. Remove other items when specifically indicated.

**2.5 CLEARING**

- A. Clear from above surface of existing ground all brush, downed timber, rotten wood, heavy growth of grass and weeds, vines, rubbish, debris that interferes with new construction and legally dispose of offsite. Remove stones larger than 4 in. in any dimension and tree roots larger than 2 inches in diameter and legally dispose of offsite.
- B. Limits of clearing to include all areas that are disturbed in the course of work.

**2.6 REMOVAL OF IMPROVEMENTS**

- A. Remove surfacing and pavements, including bases, concrete slabs, concrete and masonry walls, structures, buildings, posts, poles, fences, and other items on the property.

**2.7 STRIPPING SITE**

- A. Strip all vegetated areas that are to be disturbed by construction to a depth of two inches.
  - 1. Strip to prevent intermingling with underlying topsoil.
  - 2. Strippings shall be removed from the site.

**2.8 TOPSOIL REMOVAL AND SALVAGE**

- A. DEFINITIONS
  - 1. Topsoil: A layer of organic material typically 6 to 12 inches thick below the two inches of material to be stripped.
- B. Remove topsoil under proposed pavements, extending 2 ft. minimum beyond the pavement edge. Remove to prevent intermingling with underlying subsoil or objectionable material.
- C. Stockpile the amount of topsoil required to complete the work specified in Section 02920.
- D. Stockpile topsoil in areas as indicated by the owner or owner's representative.
  - 1. Maximum stockpile height shall be 8 feet.
  - 2. Maximum stockpile side slopes shall be 3 (horizontal) to 1 (vertical).
  - 3. Construct storage pile to freely drain surface water.
  - 4. Seed or cover storage piles to prevent erosion.

**2.9 DISPOSAL OF WASTE MATERIALS**

- A. Burning of materials is not allowed.
- B. Remove all waste materials from site and dispose of in a legal manner.
- C. Remove concrete and masonry from site.

**END OF SECTION**

**SECTION 02251**  
**TERMITE CONTROL**

**PREFACE**

The general provisions of the Contract, including the Conditions of the Contract (General, Supplementary and other Conditions) and Division 1 as appropriate, apply to the Work specified in this Section.

**1.0 SCOPE**

- 1.1 This section includes Soil Treatment
- 1.2 Submit five year guarantee for the effectiveness of the treatment.

**2.0 MATERIALS**

- 2.1 Use soil treatment chemicals and concentrations acceptable by FHA standards or passing a U.S. Forest service five year test.

**3.0 EXECUTION**

- 3.1 Treat areas under slab and grade beams before placing vapor barrier.

**END OF SECTION**

## **SECTION 02550**

### **SITE UTILITIES**

#### **PREFACE**

The general provisions of the Contract, including the Conditions of the Contract (General, Supplementary and other Conditions) and Division 1 as appropriate, apply to the Work specified in this Section.

#### **1.0 SCOPE**

- 1.1 The requirements of this section include the furnishing of all materials, labor, and equipment required for the completion of the Work. See the drawings for the extent of the utility work under this contract.

#### **2.0 MATERIALS**

As required for Bexar County, Texas Compliance installation

#### **3.0 EXECUTION**

- 3.1 Contractor, Owner, and Architect shall review all bids prior to construction.

**END OF SECTION**

**SECTION 02700  
ONSITE PIPED UTILITIES**

**PART 1 - GENERAL**

**1.1 SUMMARY**

- A. Perform all work required to complete the project as indicated by the Contract Documents, and furnish all supplementary items necessary for the completion of all work specified in this Section.
- B. The work included in this Section, while not all inclusive but listed as a guide, shall include furnishing all labor, tools, materials and incidentals required to complete the work; the complete installation of conduit for site lighting and sleeving for future use; and cleaning up.

**1.2 RELATED WORK SPECIFIED ELSEWHERE**

- A. Section 02210 – Site Earthwork

**1.3 STANDARDS**

- A. Standards will meet the requirements and recommendations of applicable portions of the standards listed:
  - 1. American Society of Testing and Materials, ASTM.
  - 2. Local Jurisdictional Standards

**1.4 JOB CONDITIONS**

**A. Site Information:**

- 1. The data on indicated subsurface conditions is not intended as representations or warranties of the accuracy or continuity between soil borings. It is expressly understood that the Owner will not be responsible for interpretation or conclusions drawn there from by the Contractor. The data is made available for the convenience of the Contractor. The Contractor, at no cost to the Owner, may make additional test borings and other exploratory operations.

**B. Existing Utilities**

- 1. It shall be the Contractor's responsibility to verify the location (horizontal and vertical depth) of all utilities prior to beginning construction. If utilities are to remain in place, provide protection from damage during construction operations.
- 2. The Contractor shall notify the Owner and utility companies when working in areas where utility lines might be encountered. The Contractor will be held responsible for all damage to utility lines as a result of work under this contract.
- 3. The Contractor shall not interrupt existing utilities serving facilities occupied and used by the Owner. In the event that service from an active utility line should need to be discontinued for any period of time, the utility will be shut down by the respective utilities. Prior to discontinuing service on any active utility line, the Contractor shall submit a request, in writing, to the Owner stating the need to shut down a specific utility. This request shall be submitted to the Owner a minimum of seven (7) days prior to service being discontinued.

**PART 2 - PRODUCTS****2.1 MATERIALS**

- A. Underground Pipe Conduit and sleeving shall be Schedule 40 PVC Pipe unless otherwise noted on the Drawings. The Contractor shall locate and flag all conduits so that they will be readily identifiable by the Owner.

**PART 3 - EXECUTION****3.1 GENERAL**

- A. The Contractor shall comply with all requirements of TXDOT Standards and with those specified herein. The most stringent will apply.
- B. It shall be the responsibility of the Contractor to insure that all trenches resulting from the placement of underground utilities are backfilled in accordance with the specifications set forth for this project. In the event that any subcontractor or public utility company fails to properly backfill their trenches, the Contractor at no additional cost shall do this work for the Owner.

**3.2 EXCAVATION**

- A. The Contractor shall excavate all materials encountered regardless of the difficulties encountered. The ditch shall be no greater in width or depth than is necessary to permit construction in accordance with the plans and these specifications. The maximum width of trench at top of pipe without sheeting, shoring, and bracing shall not be more than the external diameter of pipe plus 16 inches.
- B. All trench excavations shall meet the requirements of the TXDOT and O.S.H.A
- C. Soft, spongy or otherwise unstable material which will not provide a firm foundation for the pipe shall be removed and replaced to the extent required by the Architect. The material thus removed shall be replaced with suitable selected material from the excavation or other sources approved by the Owner and shall be compacted as provided in these Specifications. When unstable conditions are not corrected by the above means, the Contractor will be required to use rock, gravel, concrete or timber foundations. The Engineer shall determine the type of foundation. There will be no extra compensation for this work.

**3.3 BEDDING**

- A. The bedding for pipe shall provide a firm foundation of uniform density throughout the entire length of the pipe. Recesses for bells of the pipe shall be excavated for every joint and shall be of sufficient size and depth to relieve the bell of the load, permitting the barrel of the pipe to lie firmly throughout the entire length. The pipe positively will not be supported on blocks in order to raise the bell.
- B. Earth bedding shall be used unless another type is designated on the Drawings or specified per the City standards and specifications for construction. The pipe shall be placed on the natural undisturbed earth foundation that has been carefully shaped to fit the lower part of the conduit for not less than 1/4 of its circumference. When rock, shale or boulders are encountered in the trench, they shall be removed to a depth of six (6) inches below the grade line and the trench shall be refilled with good, sound earth, gravel or granular material up to the original grade and tamped into place. Bell holes will be required as above.
- C. Other types of bedding and embedment shall be provided when designated on the Drawings.

### **3.4 EMBEDMENT AND BACKFILLING**

- A. In areas outside of pavement areas the remainder of the backfill shall be placed in layers not exceeding eight (8) inches loose depth and shall be compacted by an approved method, which will obtain the density of the adjacent undisturbed soil. Backfill under pavements shall be compacted in thin, uniform, loose layers eight (8) inches or less in thickness with the maximum particle or rock size being four inches in diameter prior to compaction. Uniformly compact each lift to between 95% and 100% of maximum dry density as defined by ASTM D698, with the moisture content between optimum and four (4) percent above optimum. Water jetting will not be permitted.
- B. Bedding and Backfill shall conform to local jurisdictional requirements for pipe embedment.

### **3.5 CLEANING UP**

- A. Upon completion of the work covered by this Section, the Contractor shall clean up all work areas by removing all debris, surplus material and equipment from the site. The ground surface will be restored to within 0.10 foot of its original position.

**END OF SECTION**

## **SECTION 02751**

### **CONCRETE SIDEWALK**

#### **PREFACE**

The general provisions of the Contract, including the Conditions of the Contract (General, Supplementary and other Conditions) and Division 1 as appropriate, apply to the Work specified in this Section.

#### **1.0 SCOPE**

- 1.1 This Section covers the furnishing of all labor, materials, services, equipment and appliances required in conjunction with or properly incidental to concrete walks.

#### **2.0 MATERIALS**

- 2.1 Concrete Materials: 3000 psi concrete, refer to Division 3 for standards.
- 2.2 Reinforcing: 6 x 6 x 10 gauge welded wire mesh or as shown on drawings. Refer to Division 3 for standards.
- 2.3 1/2" "Elastite" or approved equal pre-formed bituminous material.
- 2.4 Cement shall be Portland ASTM C-150, Type I.
- 2.5 Sand shall be clean, washed Silica Graded from No. 8 mesh down.

#### **3.0 EXECUTION**

- 3.1 Concrete walks shall be full 5" thick slab poured on 2" of sand wetted and tamped over a level, hard, dry and lean sub-grade. At walks not over 8' wide provide cross slope 1/4" per foot to drain. Also provide false joints about four feet apart, or as indicated on the drawings.

**END OF SECTION**

## SECTION 03100 – CONCRETE FORMWORK

### PART 1 - GENERAL

#### 1.1 SCOPE

Provide formwork and related accessories for all cast-in-place concrete indicated on the Contract Drawings and subsequently remove all such formwork.

#### 1.2 RELATED WORK SPECIFIED ELSEWHERE

- A. Concrete Reinforcement Section 03200
- B. Cast-in-Place Concrete Section 03300
- C. Concrete formwork included in other Sections of these Specifications that is not specifically described shall meet the requirements of this Section.

#### 1.3 QUALITY CONTROL

##### A. CODES AND STANDARDS

- 1. Comply with all pertinent codes and regulations including but not limited to ACI 301 "Specifications for Structural Concrete for Buildings" and ACI 318 "Building Code Requirements for Reinforced Concrete".
- 2. Whenever provisions of pertinent codes and standards conflict with each other or requirements of this Section of these Specifications, the more stringent provisions shall govern.

##### B. QUALIFICATION OF WORKMEN

At least one quality control person shall be present at all times during the execution of this portion of the Work. This person shall be thoroughly familiar with the type of materials being installed, the referenced standards, and the requirements of this Work, and who shall direct all work performed under this Section of these specifications.

### PART 2 – PRODUCTS

#### 2.1 MATERIALS

##### A. WOOD FORMS

Shall comply with all requirements described in the FORM CONSTRUCTION paragraph in this Section.

B. EXPOSED SURFACES

New or like-new moisture resistant fir form plywood. Surface must be smooth, completely free from scratches, indentations, unsound surface knots, ripples, etching, prominent grain, depressions, warps or breaks. "Exposed surfaces" include concrete surfaces which are to be painted or dash coated.

C. UNEXPOSED SURFACES

#2 common or better, plywood.

2.2 PRODUCT HANDLING

A. PROTECTION

Use all means necessary to protect all formwork materials before, during, and after installation and to protect work and materials of all other trades.

B. REPLACEMENTS

In the event of product damage, make immediate repairs to the approval of the Structural Engineer and Architect and at no additional cost to the Owner.

2.3 MISCELLANEOUS MATERIALS

A. EXPANSION JOINT FORMING MATERIAL

Preformed asphaltic expansion joint material, thickness as indicated on contract drawings, as manufactured by W.R. Grace & Company or W.R. Meadows, Inc. See section 03300 for forming materials and sealed expansion joints.

B. FORM TIES

Form ties shall be of a type which does not leave an opening through the concrete (regular snap ties) and which permits neat and solid patching of every hole.

PART 3 – EXECUTION

### 3.1 FORM CONSTRUCTION

The design, construction, upkeep, maintenance and subsequent removal of all aspects of formwork, is the Contractor's responsibility. The Contractor shall provide formwork that is safe and properly designed for the specific method of concrete placement, type of vibration and construction loads which he will employ.

### 3.2 SURFACES TO BE FORMED

Form both sides and soffit of all suspended beams, joists, slabs and all other structural concrete below and above existing or finish grade unless shown otherwise on plans.

### 3.3 FORMING DETAILS

Conform to shape, lines, grade and dimensions required by contract drawings; use plywood sheets as large as practical; all surfaces shall be straight, plumb and properly braced; joints shall be accurately matched and mortar-tight. Reinforce sufficiently to prevent deformation under load. If adequate foundation for shores cannot be secured, provide trussed supports. Clean and oil forms before reuse. Forms shall be readily removable without hammering or prying against concrete.

### 3.4 FORM TIES

Regular shape ties should be used.

No metal shall be within one inch of finished surface when forms are removed. Wire ties will not be permitted.

### 3.5 CHAMFER STRIPS

Provide at all angles of concrete which are exposed to view, unless shown otherwise.

### 3.6 CONDUIT IN SLABS

Individual conduits in slabs shall not exceed 1" diameter. Groups of conduits or conduits larger than 1" diameter will require slab to be thickened to maintain full design thickness.

### 3.7 CONSTRUCTION JOINTS

See Section 03300, Cast-in-Place Concrete, for requirements.

### 3.8 OILING OF FORMS

- A. Lightly coat with nonstaining form oil for exposed surfaces. Before placing reinforcing, remove surplus oil.
- B. In lieu of using an oil coat, forms for unexposed surfaces may be thoroughly wetted with water, immediately before placing concrete.

### 3.9 STRIPPING OF FORMS

- A. Side forms of beams may be removed after cumulatively curing at not less than 50 degrees F(10 degrees C) for 24 hours after placing concrete, provided concrete is sufficiently hard to not be damaged by form removal operations, and provided curing and protection operations are maintained.

END OF SECTION 03100

## SECTION 03200 - CONCRETE REINFORCEMENT

### PART 1 - GENERAL

#### 1.1 SCOPE

Furnish and install all reinforcement and related items required and/or indicated on the Contract Drawings for all cast-in-place concrete.

#### 1.2 RELATED WORK SPECIFIED ELSEWHERE

- |    |                        |               |
|----|------------------------|---------------|
| A. | Concrete Formwork      | Section 03100 |
| B. | Cast-in-Place Concrete | Section 03300 |

#### 1.3 QUALITY ASSURANCE

##### A. CODES AND STANDARDS

1. Comply with all pertinent codes and regulations. Concrete reinforcement, unless otherwise noted, shall meet requirements of ACI 301 "Specifications for Structural Concrete for Buildings" and/or ACI 318 "Building Code Requirements for Reinforced Concrete".
2. Whenever provisions of pertinent codes and standards conflict with each other or requirements of this section, the more stringent provisions shall govern.

##### B. QUALIFICATIONS OF WORKMEN

At least one quality control person shall be present at all times during execution of this portion of the work. This person shall be thoroughly familiar with the type of materials being installed and the best methods for their installation and shall direct all work performed under this section.

#### 1.4 SUBMITTALS

##### A. CERTIFICATES

When requested by the Engineer, supplier of reinforcing steel and other embedded materials shall furnish certified evidence that all materials

delivered to the project meet the requirements of this Section of the Specification.

B. SHOP DRAWINGS

1. The Contractor shall obtain completely detailed shop drawings showing placement plans, bar bending lists and diagrams, etc. Shop drawings shall include the specific location and size of all accessories, chairs and bar supports. The Contractor shall carefully check these drawings, then submit them to the Architect/Engineer. The Architect/Engineer may conduct limited spot checks aimed solely at determining general compliance with the design intent, then return them to the Contractor. The Contractor shall then carefully recheck the shop drawings and approve them prior to fabrication.
2. The Engineer's limited spot checks shall not relieve the Contractor from correcting, at his own expense, any items that may thereafter be found not to comply with the contract drawings and these specifications.
3. All straight and bent bars shall be tagged with the member mark, regardless of the fabricators standard policy or other industry standards of practice. If the fabricator elects to use member marks other than those shown on the structural drawings, the members must also be labeled with the original engineer's member marks in addition to those of the fabricator.

1.5 PRODUCT HANDLING

A. PROTECTION

1. Protect concrete reinforcement and installed work and materials of other trades before, during, and after installation.
2. Store reinforcing in a manner to prevent excessive rusting and fouling with dirt, grease and other bond-breaking coatings.
3. Use all means necessary to maintain identification after the bundles are broken.

PART 2 - PRODUCTS

## 2.1 MATERIALS

### A. REINFORCING BARS

All reinforcing bars shall comply with ASTM A-615, Grade 60, except beam stirrups and column ties may be Grade 40 unless noted otherwise.

### B. WELDED WIRE MESH

Flat sheets only. Comply with ASTM A-185.

### C. ACCESSORIES

1. Comply with the latest edition of "Manual of Standard Practice for Detailing Reinforced Concrete Structures" (ACI-SP66), except that beam reinforcing larger than #9 shall be supported on individual bar chairs spaced no greater than 2'-0" apart. Accessories resting on forms where underside is left exposed to view, or where plaster, paint, stucco, or dash coat is to be applied shall be galvanized or have plastic leg tips at all points of contact with forms.
2. Accessories fabricated completely from plastic will not be permitted.
3. Accessories for use on cardboard carton forms shall have continuous metal sand plates.
4. Steel other than that of domestic manufacture will not be permitted.

## PART 3 - EXECUTION

### 3.1 FABRICATION

- A. The Contractor shall be responsible for obtaining properly fabricated reinforcing and placing it properly. Reinforcing shall be fabricated in accordance with the latest edition of the "Manual of Standard Building Code Requirements for Reinforced Concrete" (ACI 318).
- B. Reinforcing steel shall be free from rust, scale, dried concrete, or other coatings that will destroy or reduce bond.

- C. Reinforcing steel shall be accurately bent and placed in position, securely tied or supported to prevent movement during placing of concrete. Field bends will not be permitted without prior approval from Engineer.
- D. Spacer bars, supports and accessories are not scheduled but are to be furnished and placed as described under MATERIALS paragraph in this Section.
- E. Raising of reinforcement (including welded wire fabric) during the pour will not be permitted.

### 3.2 CONCRETE COVER

- A. Reinforcing bars shall have concrete cover as follows, unless noted otherwise:
  - 1. Beam Stirrups; top, bottom and sides, 1-1/2".
  - 2. Column ties and spirals, 1-1/2".
  - 3. Concrete joists, 1-1/2"
  - 4. Concrete slabs, 3/4".
  - 5. Drilled footings, 2-1/2".
  - 6. Spread or spot footings, 3".
  - 7. Waterproofed walls or above grade walls, 3/4".
  - 8. Below grade walls (without waterproofing), 1-1/2".

### 3.3 SLAB AND BEAMS ON FILL

- A. Reinforcing shall be held securely in position with concrete cover as follows:
  - 1. Beam stirrups; top, 1-1/2", bottom and sides 2-1/2".
  - 2. Slab bars; 1-1/2" from top.
- B. Support reinforcing steel on concrete blocks or bricks spaced at approximately 4'-0" o.c. in each direction.

### 3.4 SPLICES

Splices not shown on contract drawings or otherwise noted shall be in accordance with ACI specifications for bar sizes up to #11 size, but not less than 55 bar diameters. Splices in bars larger than #11 shall be made with approved thermal or mechanical coupling devices. Welding wire fabric shall be lapped 1-1/2 meshes, with a minimum lap of 8".

### 3.5 SLAB OPENINGS

At slab openings of 12" or less, spread main reinforcing around opening. At slab openings greater than 12", provide 2 #4x4'-0" bottom placed diagonally at each corner. At sides of openings, provide one full bar for each bar cut at opening. No main reinforcing bars shall be cut without Engineer's approval.

### 3.6 EQUIPMENT/DUCTS

Provide adequate reinforcing as approved by Engineer for all required openings through beams, slabs, joists, walls, etc., and for distribution of equipment loads to structural members.

### 3.7 CONDUITS IN SLABS

Electrical and mechanical conduit in slabs shall run under upper layer of reinforcing or wire mesh; provide a minimum of 1-1/2" clear between conduits and between conduit and parallel reinforcing. Do not "bundle" conduits. See Section 03100 for thickened slab required at conduits larger than 1".

### 3.8 BEAM INTERSECTIONS

Unless shown otherwise on plans, at corners, angle bends and at junction with other beams, provide four #7x7'-0" "corner bars" (3.5 ft. each leg), 2 top and 2 bottom. For deep beams with scheduled intermediate bars, provide matching 110 diameter "corner bars" of same size. At "T" intersection, place all "corner bars" so that one leg is in outside face of outside beam.

### 3.9 TOPPING REINFORCEMENT

Reinforcement (including welded wire fabric) shall be chaired to proper depth as shown on plans and sections. Raising of reinforcement during pour is not acceptable.

3.10 CONSTRUCTION JOINTS

- A. All reinforcing shall continue through the joint.
- B. Add extra reinforcing if so directed by Engineer.

END OF SECTION 03200

SECTION 03300 - CAST-IN-PLACE CONCRETEPART 1 - GENERAL1.1 SCOPE

Cast-in-place concrete required for this work is indicated on the Contract Drawings.

1.2 RELATED WORK DESCRIBED ELSEWHERE

- |    |   |               |
|----|---|---------------|
| A. | Structural Engineer: Shop Drawings and Field Visits | Section 01341 |
| B. | Concrete Formwork                                   | Section 03100 |
| C. | Concrete Reinforcement                              | Section 03200 |

1.3 QUALITY CONTROLA. CODES AND STANDARDS

Comply with all pertinent codes and regulations, including but not limited to the requirements of ACI 301, "Specifications for Structural Concrete for Buildings" and ACI 318, "Building Code Requirements for Reinforced Concrete". Also, refer to ACI 302 "Guide for Concrete Floor and Slab Construction."

B. QUALIFICATIONS OF WORKMEN

At least one quality control person shall be present at all times during execution of this portion of the work. This person shall be thoroughly familiar and experienced in placing the types of concrete specified and shall direct all work performed under this Section. Finishing of exposed surfaces of the concrete, shall be performed by thoroughly trained and experienced journeyman concrete finishers.

C. CONCRETE QUALITY

The Contractor shall be responsible for all aspects of concrete production, including maintenance and control of the quality of the concrete through

batching, mixing, placing and curing of the concrete. He shall take whatever measures he deems necessary to accomplish this. To assure the Owner of the quality of the work, the contractor shall employ an independent testing laboratory to perform certain services as described below. The performance of these services does not relieve the Contractor of his responsibility.

D. CONCRETE MIX DESIGN

1. Design each type of concrete to be used on the project based on aggregate size and cement proportions specified in Part 2 - Products. Laboratory shall go to the designated concrete supplier's batching plant and obtain samples of ingredients which shall be used in determination of compliance with ASTM C-33 and in the preparation of confirmatory test specimens.
2. Using the proposed mix design, the laboratory shall make one set of four test cylinders for each type of concrete. The results of two 7-day compression tests shall be submitted with the proposed mix design prior to placement of concrete on the job. Subsequently, results of two 28-day compression tests shall be submitted and the strength shall be at least 25% greater than the specified minimum strength for concrete placed on the job.
3. In lieu of new mix designs, the laboratory may submit data of previously prepared "standard" mix designs provided:
  - a. The mix design was prepared by the laboratory in strict accordance with the provisions of this section of the specifications.
  - b. The mix design shall have been prepared within the preceding six months. Documentation shall not reference any specific construction project.
  - c. The laboratory shall submit written certification that the materials used in the submitted mix designs are currently stocked at the batching plant.

E. CONCRETE TESTING

1. Concrete tests shall be performed by a commercial testing laboratory approved by the Structural Engineer. Services as set out below shall be paid by the General Contractor.

2. The Laboratory shall take samples and perform slump and compression tests in accordance with ASTM C-39 on concrete placed each day at the rate of one set of four cylinders for each 80 cu. yds. or fraction thereof. When more than 80 cu. yds. is being continuously placed, the interval between test samples shall be at least 50 cu. yds. so as to be representative of the whole day's pour. Samples shall be taken at the point of deposit in the field and all cylinders shall be accurately marked and referenced to show date, time and exact location in the structure from which they came. Make 7-day test on two cylinders and 28-day test on two cylinders. Reports of tests shall be promptly sent as follows: two to the Architect, one to the Engineer, and one to the Contractor.

F. BELOW STRENGTH CONCRETE

If the 28-day cylinder strengths fall below the specified strength, the concrete represented by such test cylinders shall be considered unacceptable and subject to removal. Consideration will be given to the acceptance of such concrete if it can be demonstrated to the satisfaction of the Engineer that the cylinder tests do not accurately represent the strength of the concrete in place, or that the structure is fully capable of carrying the loads for which it was designed. This data may be obtained by a series of non-destructive tests and core tests in accordance with ASTM C-42. The general contractor is responsible for all costs in connection with this additional testing and/or removal and replacement of defective concrete.

1.4 SUBMITTALS

A. MATERIALS LIST

Within 35 days after award of Contract, and before any concrete is delivered to the job site, submit to the Architect in accordance with Section 01300 of these Specifications a complete list of all materials proposed to be furnished and installed under this portion of the Work, showing manufacturer's name and catalog number of all items such as admixture and membrane, and the name and address of transit-mix concrete supplier.

B. TRANSIT-MIX DELIVERY SLIPS

1. Keep a record at the job site showing time and place of each pour of concrete together with transit-mix delivery slip certifying contents of the pour.

2. Make the record available to the Architect/Engineer for his inspection upon request.
3. Upon completion of this portion of the Work, deliver the record and the delivery slips to the Architect.

## 1.5 PRODUCT HANDLING

### A. PROTECTION

Protect cast-in-place concrete materials before, during, and after installation. Protect the work and materials of all other trades.

### B. REPLACEMENTS

In the event of damage, at no additional cost to the Owner, immediately make all repairs and replacements necessary to the approval of the Architect/Engineer.

## PART 2 - PRODUCTS

### 2.1 MATERIALS

When requested by Engineer, supplier of concrete materials shall furnish certified evidence that all materials delivered to the project meet the requirements of this section.

### 2.2 PORTLAND CEMENT

Type 1 or Type 3, comply with ASTM C-150.

### 2.3 FLY ASH

Fly ash may be used as a pozzolan to replace a portion of the Portland Cement in a concrete mix, subject to the approval of the Structural Engineer. Fly ash, when used, shall conform to ASTM C-618. Concrete mixes using fly ash shall be proportioned to account for the properties of the specific fly ash used and to account for the specific properties of the fly ash concrete thus resulting. The ratio of the amount of the fly ash to the total amount of fly ash and cement in the mix shall not exceed 20 percent by weight.

## 2.4 CONCRETE AGGREGATES

Comply with ASTM C-33. Maximum aggregate size is 1-1/2".

## 2.5 WATER

Potable.

## 2.6 CONCRETE

### A. PROPORTIONS

Use the following cement content minimums:

<u>28 day strength Specified</u>	<u>Sacks of Cement/ cu.yd. of Concrete</u>
1. 3000 psi, reg.wt., with admixture	5

### B. CONCRETE SLUMP

Concrete shall be mixed and delivered in accordance with "Standard Specifications for Ready-Mixed Concrete", ASTM C-94. Maximum slump: 5 inches.

### C. GROUT

Equal parts sand and cement. See STRUCTURAL STEEL Section for special grouts.

## 2.7 MIXING CONCRETE

Concrete shall be mixed and delivered in accordance with "Standard Specifications for Ready-Mixed Concrete", ASTM C-94.

## 2.8 EXPANSION JOINT FORMING MATERIAL

Preformed asphaltic expansion joint material, thickness as indicated, as manufactured by W. R. Grace & Company or W. R. Meadows, Inc.

## 2.9 SEALED EXPANSION JOINTS MATERIALS

Sealant: Two-component polyurethane elastomeric sealant, "Daraseal-U, Traffic Grade" as manufactured by W. R. Grace & Company or equal.

## 2.10 JOINT FILLER

Resilient, preformed, non-extruding type such as cork, sponge rubber, or PVC foam, as manufactured by W. R. Grace & Company, or equal, and which is recommended by the Manufacturer to be used with sealant selected.

## 2.11 CURING MATERIAL

- A. For all slabs except those on which additional concrete or other toppings are to be bonded, use a water-based acrylic membrane curing compound that has a maximum volatile organic compound (VOC) rating of 350 g/L (3 lbs/gal.) complying with ASTM C309, Type I, Class B. Available products include VOCOMP-20 (W. R. Meadows, Inc.), MasterKure 100W (Master Builders, Inc.), Dress and Seal WB (L & M Construction Chemicals, Inc.), or approved equal.
- B. For slabs having bonded toppings, use "Sisalkraft" paper as manufactured by the American Sisalkraft Company.

## 2.12 EMBEDMENTS

Metal sleeves, anchors, hangers, dovetail anchor slots and all embedments; furnish and locate by respective trade or by General Contractor. Secure approval of Engineer for installation of sleeves and conduits in structural members.

## PART 3 - EXECUTION

### 3.1 CONCRETE PLACEMENT

- A. Unless otherwise noted, concrete shall be mixed and placed in accordance with ACI "Standard Building Code Requirements for reinforced Concrete" (ACI 318), latest edition.
- B. Before placing concrete in a given section, the following items shall be completed:
  - 1. All reinforcing, base plates, dowels, etc., shall be completely and securely tied in place for the entire section to be concreted. Anchor

bolts and embedded items requiring accurate location shall be positioned and leveled by the use of templates and instruments, and securely held in place so that no movement occurs during the placement of concrete.

2. All forming, bulkheads, construction joints, keyways, sleeves inserts, plates etc., and embedded work of other trades shall be complete for the entire section to be concreted.
  3. All materials and equipment for curing and protecting concrete shall be at the job site.
  4. Runways shall be provided for wheeled equipment to protect reinforcing steel. Runways and equipment used in mixing, conveying, lifting and depositing the concrete shall be in good condition, adequate to support all construction loads and suitable and safe for the workmen.
  5. Water and debris shall be removed from space to be occupied by concrete.
- C. See CONCRETE FORMWORK Section for wetting of forms immediately before placing concrete.

### 3.2 NOTIFICATION OF POURING SCHEDULE

- A. Before batching concrete for placement, the Contractor shall see that all applicable provisions of the contract drawings and specification have been complied with for the entire section to be concreted, and he shall notify the Architect/Engineer of this fact. This notification shall be given at least 24 hours prior to the time that the concrete placement is scheduled to begin and no concrete shall be placed until authorized by the Architect/Engineer. The Contractor shall inform himself of possibly unfavorable weather conditions and shall give due consideration to the weather in scheduling the placement of concrete.
- B. Concrete shall not be deposited during rain unless adequately protected. Preparations shall be on hand to protect newly placed concrete from rain until it has hardened sufficiently so that it will not be damaged. In the event rain starts falling during the placement of concrete, the Contractor shall take

such measures as are required to assure that the strength of the structure will not be impaired and the surface finishes will be as specified.

### 3.3 COLD WEATHER PLACING

- A. Concrete at the time it is deposited shall have a temperature not below 50 degrees F. and not above 90 degrees F.
- B. When the temperature of the surrounding air is below 40 degrees F. suitable means shall be provided for maintaining the concrete at a temperature not below 50 degrees F. for 5 days after placing; except when high early strength cement is used, the time may be reduced to 3 days.
- C. Special protection shall be carefully planned and all materials, equipment, etc., shall be at the job site prior to placing of any concrete. In general, these measures may include temporary heaters, coverings, and enclosures. The enclosures, coverings, etc., used in connection with this special protection shall remain in place and intact at least 24 hours after the artificial heating is discontinued so that the temperature change in the concrete will occur gradually.
- D. In scheduling forming and shoring removal, Contractor shall take into account the fact that at temperatures below 50 degrees F., concrete gains strength very slowly.
- E. Use of salt or chemicals shall not be mixed with the concrete to prevent freezing.

### 3.4 HOT WEATHER PLACING

- A. Concrete at the time it is deposited shall have a temperature not higher than 90 degrees F.
- B. Steps shall be taken to reduce concrete temperature and water evaporation by proper attention to ingredients, production methods, handling, placing, protection and curing.

### 3.5 PLACING CONCRETE

Convey continuously until the entire section to be concreted is completed. Partially hardened or initially set concrete shall not be used. Compaction by

mechanical vibrating equipment shall be required for all concrete. Place in layers not over 12" deep and compact each layer, supplemented by hand-spading, rodding and tamping.

### 3.6 CONVEYING

Concrete shall be conveyed from the mixer to the forms as rapidly as practicable by proper methods which will not cause segregation or loss of ingredients. It shall be deposited as nearly as practicable in its final position in the forms. At any point in the conveying, the free vertical drop of the concrete shall not exceed 4 feet. Chuting will be permitted only where the concrete is deposited into a hopper before it is placed in the forms. Chutes shall be constructed of metal or shall be metal lined. Conveying equipment shall be cleaned thoroughly before each run. All concrete shall be deposited as soon as practicable after the forms and the reinforcement have been observed by the Engineer. Concrete which has segregated in conveying shall be removed.

### 3.7 SURFACE DEFECTS

Patch honeycomb, tie rod holes, and minor defects with one part cement and two parts sand immediately after removing forms and before concrete is thoroughly dry. Remove fins and rough edges.

### 3.8 BONDING NEW CONCRETE TO OLD

Clean, roughen, and coat with latex bonding agent.

### 3.9 CONSTRUCTION JOINTS

- A. Provide in monolithic concrete framing so that not more than 400 cubic yards is placed in one day and no side dimension of the section being concreted is greater than 150 feet. Larger areas require approval by the Engineer.
- B. Location shall generally be near the middle of the spans of slabs and beams with wood or steel-formed soffits. When soffits are formed with cardboard cartons, locate construction joint on centerline of pier..
- C. Provisions shall be made for transfer of shear and other forces through the joint. Generally this shall consist of forming horizontal keyways at

mid-depth, 1-1/2" deep X 1/3 of beam or slab depth and allowing all reinforcing to continue through the joint. Add extra reinforcing if so directed by Engineer.

### 3.10 EXPANSION JOINTS

- A. For flatwork, sidewalks, drives, approaches, form expansion joints with preformed asphaltic expansion joint material.
- B. No part of the expansion joint material shall extend above the surface of the concrete. Trim off any excess as required.

### 3.11 SEALED EXPANSION JOINTS

Provide unless otherwise indicated on the Drawings. Follow manufacturer's recommendations and instructions in all phases including filler installation, cleaning, bond breaking between filler and sealant, priming, mixing and application of sealant. Sealant shall be installed only by experienced personnel and shall have a thickness of one-half the width of the joints except the minimum thickness shall be 1/2".

### 3.12 FINISHES

Refer to architectural drawings for all floor finishes, locations and dimensions of slab drops and depressions floor checks, chamfers, and special concrete treatments. Carefully work out all finishes to agree with other materials and finishes. Verify all elevations, levels and conditions. Carefully tool all exposed edges.

### 3.13 FLOORS

Edge forms and intermediate screed strips shall be set accurately to produce the designated elevations and contours of the finished surface, and shall be capable of supporting all screeding operations. Refer to Architectural Drawings for all floor and roof finishes, floor coverings, and dimensions and locations of slab drops, slopes, and depressions. Unless otherwise noted, concrete slab finishes and tolerances including consolidation, floating, troweling, brooming, etc., shall be as described in ACI 301, Chapter 11, for the type of surface indicated on Architectural Drawings.

### 3.14 FLOOR FLATNESS AND LEVELNESS

- A. Flatness and levelness tolerances for floors shall conform to the requirements set forth in ACI 117, "Standard Tolerances for Concrete

Construction and Materials", particularly section 4.5.6 and 4.5.7. Either of the following specifications is acceptable.

1. Face Floor Profile Numbers (F-Numbers):  
CONVENTIONAL, BULL-FLOATED; Flatness  $F_f = 15$  Level  $F_l = 13$   
CONVENTIONAL STRAIGHTEDGED; Flatness  $F_f = 20$  Level  $F_l = 15$   
FLAT; Flatness  $F_f = 30$  Level  $F_l = 20$   
VERY FLAT; Flatness  $F_f = 50$  Level  $F_l = 30$
2. 10-ft. Straightedge Method:  
CONVENTIONAL, BULL-FLOATED; 1/2 in.  
CONVENTIONAL, STRAIGHTEDGED; 5/16 in.  
FLAT; 3/16 in.  
VERY FLAT; 1/8 in.

B. Unless noted otherwise, slab surfaces shall conform to the following criteria:

1. Offices, classrooms, corridors, etc: FLAT.
2. Warehouses, storerooms, equipment rooms: STRAIGHTEDGED.
3. Sidewalks, plazas, pavement: BULL-FLOATED.

### 3.15 FINISHES OTHER THAN FLOORS AND SLABS

Concrete exposed to view, both interior and exterior, shall be rubbed with Carborundum bricks and water no sooner than 48 hours and not later than one week after pouring. Plastering such surfaces will not be permitted. Remove all form marks, bulges, and irregularities. Finished surfaces shall be true and uniform in texture.

### 3.16 CURING AND PROTECTION

- A. All concrete shall be protected from premature drying for at least the first 7 days after placement. Curing compound shall be applied in strict accordance with manufacturer's directions just as soon as concrete has taken it's initial set and can receive compound without damaging the finish. All curing materials and equipment shall be on the jobsite before concrete is ordered.

- B. Floor areas which are designated to have a permanently exposed concrete surface require a two-coat application of curing and sealing compound. Apply one coat at the time of finishing and a second coat immediately prior to "Substantial Completion" of project.
- C. At floor areas scheduled to receive ordinary floor finishes (except bonded concrete or cementitious materials) apply one coat of specified curing compound in accordance with manufacturer's directions.
- D. At floor areas scheduled to receive bonded concrete topping, ceramic tile, terrazzo or other cementitious floor finishes, DO NOT USE CURING COMPOUND. Such areas shall be cured with lapped and taped "Sisalkraft" paper or absorptive mats or fabric kept continuously wet during the entire curing process.
- E. Vertical surfaces such as walls, columns, etc., may be cured by loosening the form and allowing water to run down between the concrete and the form, or by keeping the forms continuously wet.

### 3.17 CEMENT WASH

Where required at locations such as vents, grilles, ledgers; provide neatly finished cement wash of one part cement to 2-1/2 parts clean sand.

### 3.18 CLEANING

Clean all concrete work of mortar, plaster, paint, grease, oils, etc. Defective areas shall be replaced or repaired.

END OF SECTION 03300

**SECTION 03362 – BURNISHED CONCRETE FLOOR FINISHES****A. PART 1 – GENERAL****B. PROTECTION**

**Refer to the Room Finish Schedule for all areas of the building where concrete slab is to be burnished. All precautions after pour should be made to protect the floor from damage including prohibiting the use of chalk lines that could stain the concrete, pencil markings, etc.**

**Only scissor lifts will be allowed on the slab. Vehicles, forklifts, skid steer loaders, etc. are not allowed on the slab. Do not allow acids to contact the surfaces. Do not place any materials on the slab that may cause staining etching or scratching. Burnishing should be performed before, painting, millwork installation, and interior walls are installed. Protect finished burnished floor with 6 mil visqueen and 1/8" masonite smooth side down with taped joints.**

**1.1 SUMMARY**

A. Section Includes: Application of densifier and protective treatment and burnishing of concrete floor slabs.

B. Related Sections: Section 03312- Cast-In-Place Concrete Slabs (Interior). Concrete for interior slabs on grade.

C. Existing Section of Concrete Floor: Fill all holes, depressions and cracks with hardener, apply Colloidal Silica and burnish floor to the best attainable finish

**1.2 REFERENCES**

A. The publications listed below form a part of this specification to the extent referenced. Publications are referenced within the text by the basic designation only.

B. ASTM International (ASTM):

ASTM C1028 - Standard Test Method for Determining the Static Coefficient of Friction (SCOF) of Ceramic Tile and Other Like Surfaces by the Horizontal Dynamometer Pull-Meter Method.

**1.3 SUBMITTALS**

A. Section 01330 - Submittal Procedures: Procedures for Submittals.

B. Submit to Architect specified in Section 01330 Construction Testing Laboratory specified in Section 01458.

C. Product Data:

Densifier: **Colloidal Silica**: Brand name, chemical composition, installation directions and certificates of compliance with required standards. Submit 30 days prior to first concrete placement.

Protective Treatment: Brand name, chemical composition, installation directions and certificates of compliance with required standards. Submit 30 days prior to first concrete placement.

Burnishing Pads: Submit product data for burnishing pads prior to beginning burnishing operations to verify pad texture.

Submit 30 days prior to first concrete placement.

E. Provide name of technically qualified densifier manufacturer's field representative.

## 1.5 PRODUCT DELIVERY, STORAGE AND HANDLING

A. Dispense densifier protective treatment finish material from factory numbered and sealed drums. Maintain record of drum numbers.

## 1.6 ENVIRONMENTAL REQUIREMENTS

A. Limit and control damage from excessive dust caused by burnishing.

B. Limit and control damage from moisture. Remove standing moisture from floor after densifier application.

## 1.7 WARRANTY

A. Document 00800 - Supplementary Conditions: Requirements for warranties.

B. Densifier Finish:

Provide 20 year manufacturer's material warranty commencing at date of building Substantial Completion. Manufacturer shall warrant to the Owner that treated surface will remain sealed, dustproof, hardened and abrasion resistant for the duration of the warranty period.

## PART 2 - PRODUCTS

### 2.1 MANUFACTURERS

A. Subject to compliance with project requirements, provide products as manufactured by the following to the extent as specified hereinafter for the specific product: Equal to:

Prosoco, Lawrence, KS, (866) 363-4567 [www.prosoco.com](http://www.prosoco.com)

## 2.2 DENSIFIER AND PROTECTIVE TREATMENT PRODUCTS

A. Pre-Densifier Floor Cleaner: As recommended by densifier manufacturer.

B. Densifier: **Colloidal Silica**: Concrete chemical densifier specifically for concrete surface treatment which reacts chemically to the concrete surface forming a clear, dense, durable, hard, abrasion-resistant surface. Product shall be a colorless, odorless, water-based solution that is less than 50 VOC.

C. Protective Treatment: Provide protective treatment by same manufacturer as provided for the densifier.

D. Protective Treatment Mopping Pads:

Professional Mighty Mop 077 by Quickie.  
24" Microfiber Wet Room Pad by Rubbermaid.

E. Sprayer: Manufacturer approved high volume, low pressure sprayer and sprayer tip.

## 2.3 POLISHING PRODUCTS

A. Burnishing Pads: Pads as follows or equivalent as required to produce specified results:

1. Diamond Impregnated Pads:

- a. Twister Diamond Cleaning System Pads by HTC.
- b. SpinFlex Diamond Polishing Pads by CPS.
- c. Optima pad system by VIC.

2. Hogs Hair Pads:

- a. Niagra Super Hogs Hair Floor Pad 3700N by 3M.
- b. Ultra Grizzly Bear by Norton.
- c. 2001 Gorilla by ETC.

## 2.4 EQUIPMENT

A. Scrubber Machines Equipment used for cleaning operations shall be Clark Encore Max38 or L38 with a head pressure of 150 lbs. or similar equipment as required to produce the specified results.

B. Burnishing Machine: High speed burnisher, with a min. 27 inch head generating pad speeds of 1,500 RPM or higher as verified with tachometer.

## PART 3 - EXECUTION

### 3.1 GENERAL CLEANING AND BURNISHING REQUIREMENTS

A. Coordinate with joint filling operations. Do not perform wet cleaning within 72 hrs prior to joint filling.

- B. Do not use stain or scuff removing agents such as "crete-strip".
- C. Clean floors as specified hereinafter prior to application of densifier.
- D. Burnish floors as specified hereinafter after application of protective treatment.
- E. Utilize riding machines to the maximum extent practical to achieve optimum efficiency.
- F. Final finish sheen shall be equivalent to that as accepted on the Floor Test Slab located in Mechanical Room 110..

### 3.2 CLEANING

- A. Use sweeping compound to control airborne dust. Scrape floor to remove remaining saw cut residue and paint droppings. Remove paint droppings with soft, damp cloth and solvent stripper. Do not use stripper with an acidic pH.
- B. Treat oil spots with oil emulsifier and oil absorber materials.
- C. Double scrub floor with scrubber machine and appropriate brushes or pads and pH compatible detergent.

### 3.3 DENSIFIER APPLICATION

- A. Area to be treated: Apply Colloidal Silica densifier and protective treatment finish to all interior concrete floors.

- B. Examination and Preparation:

Examine surfaces receiving densifier. Verify that surfaces conform to product manufacturer's requirements for substrate conditions.

Vacuum and clean saw cut joints and surrounding area so that no dust remains to react with concrete finish material.

Remove remnant of temporary film forming curing compound prior to application of densifier. Remove compound by cleaning and scrubbing in accordance with manufacturer's instructions.

Prior to application, scrub floor with pre-densifier floor cleaner to remove latent salts. Do not proceed until unsatisfactory conditions have been corrected.

Beginning of application indicates acceptance of existing conditions.

- C. Application:

Application shall be performed by certified applicator in accordance with manufacturers published instructions.

Schedule to begin 7 days after floor slab placement.

Employ methods to ensure concrete surface is not damaged during application, including discoloration.

Apply densifier finish at the rate of 500 SF per gallon.

Apply with low pressure sprayer with enough coverage to keep concrete surface wet for minimum 20 minute period.

### 3.4 PROTECTIVE TREATMENT APPLICATION

A. Area to be Treated: Subsequent to densifier application and within two weeks prior to Owner Possession, apply protective treatment over surfaces to which densifier has been applied.

B. Examination and Preparation: Prior to application, applicator shall examine the areas and conditions to be treated to assure satisfactory conditions.

C. Application:

Apply in accordance with manufacturer's published instructions

Apply at the rate of 1,500 SF per gallon per manufacturer's recommendation. Avoid application in excess of the recommended rate.

Apply with low pressure sprayer.

Use protective treatment mopping pads for spreading as required to create a thin film.

Remove product completely from areas of over-application as evidenced by surface streaking and replace with unused sealer.

D. Do not allow water or other liquids to come in contact with finished floor for 72 hours after protective treatment application.

### 3.5 BURNISHING PROCEDURE

A. Allow to dry. Provide a section of sample burnishing on the floor of Mechanical Room 110.

B. Burnish at a slow movement pace using burnishing machine with 800 grit diamond impregnated or hogs hair burnishing pads.

C. Burnishing, pad type, and pace of forward movement shall combine to develop a minimum floor surface temperature of 91F directly below the burnishing pad as continuously measured by the operator during installation.

D. Conduct burnishing operations until the specified gloss is attained.

E. Provide final burnishing prior to Owner Possession to eliminate any scratches resulting from construction operations.

### 3.6 FINISH REQUIREMENTS

A. Gloss: Final surface gloss shall be a Specified Overall Gloss Value (SOGV) of not less than 30 and a maximum of 45, and a Minimum Local Gloss Value (MLGV) of 20 as measured using a Horiba IG-320 Gloss Checker.

B. Slip Resistance: Measured static coefficient of friction (SCOF) shall be not less than 0.50 as measured in accordance with ASTM C 1028, at time of Owner Possession.

### 3.7 FLOOR PROTECTION

A. Protect finished floor from construction traffic and weather with a layer of 6 mil plastic sheeting and complete coverage with 1/8" masonite panels with taped joints, until time of final burnish if necessary and prior to owner occupancy.

B. Prevent exposure of moisture at slab surface during 72 hour curing period following densifier application. Place wood pallets or cardboard boxes over a breathable material that separates the pallet from the floor surface.

C. Prohibit acids and acidic detergents to come in contact with slab.

### 3.8 PRODUCT DISPOSAL

A. Upon completion of densifier treatment, dispose of excess material as required by local agency having jurisdiction.

B. Certified applicator shall remove densifier and protective treatment product containers from job site immediately upon completion of treatment.

**END OF SECTION**

**SECTION 04200****UNIT MASONRY & MASONRY VENEER****PREFACE**

The general provisions of the Contract, including the Conditions of the Contract (General, Supplementary and other Conditions) and Division 1 as appropriate, apply to the Work specified in this Section.

**1.0 SCOPE**

- 1.1 This section includes stone veneer, mortar and accessories.

**2.0 MATERIALS**

- 2.1 Stone color and shape to match existing portions of stone wall.
- 2.3 Hydrated Lime: ASTM C-207, Type S
- 2.4 Sand: ASTM C-144
- 2.5 Water: Clean Drinkable
- 2.6 Mortar shall be placed accurately proportioned and mixed thoroughly by hand or machine to a uniform consistency and color. Re-tempering or partially set mortar shall not be permitted.
- 2.7 Mortar for all masonry work shall be mixed as follows:
- 1 part Portland Cement (white)
  - 1 part Lime
  - 6 parts yellow Sand
- Exact color of mortar to match existing mortar at stone walls.
- 2.8 Masonry Accessories
- Adjustable hot-dipped galvanized masonry ties for brick veneer from Hohmann & Bernard or approved equal.

Weep holes to be formed by ¼" round x 4" long medium density polyethylene plastic tubes spaced at 32" o.c. horizontally at base of wall.

- 2.3 Steel lintels to conform to specification for structural steel in Division 5. Steel reinforcing to conform to specification for reinforcing in Division 3.

### 3.0 EXECUTION

- 3.1 Verify all dimensions and conditions relating to masonry work. Report any conditions which may prevent proper execution of masonry work to the Architect. Commencement of work will be construed as acceptance of conditions.
- 3.2 Coordinate masonry work with related work. Allow for or install all mechanical and electrical parts, leaving all chases, recesses, openings. Bolts and anchors required by other subcontractors shall be set to templates or dimensions furnished by them. Build in all blocking and grounds required for the Project. Cooperate in setting and bedding all metal work built into or set in conjunction with masonry. Build in all flashing and waterproofing elements.
- 3.3 During erection, cover top of wall with heavy waterproof sheeting at the end of each day's work. Cover partially completed structures when work is not in progress. Extend cover a minimum of 24" down both sides and hold cover securely in place.
- 3.4 Do not apply concentrated loads for at least 3 days after building masonry walls.
- 3.5 Prevent grout or mortar from staining the face of masonry to be left exposed or painted. Remove immediately grout or mortar in contact with such masonry. Protect sills, ledges and projections from droppings of mortar.
- 3.6 Weather Protection:
1. When air temperature is from 40 to 32 degrees Fahrenheit, heat sand or mixing water to produce mortar temperatures between 40 & 120 degrees.
  2. When air temperature is from 32 to 25 degrees Fahrenheit, heat as described above and maintain temperature of mortar on boards above freezing.
  3. When air temperature is from 25 to 20 degrees, heat and maintain as described above and use salamanders or other heat sources on both sides of walls under construction; use wind breaks when wind is in excess of 15 mph.

4. When air temperature is 20 degrees and below, stop all masonry operations.
5. When mean daily air temperature is from 40 to 25 degrees, completely cover masonry with weather resistive membrane for at least 24 hours.
6. When mean daily air temperature is 25 degrees and below, completely cover masonry with insulation blankets or similar protection for at least 24 hours.
7. Do not lower the freezing point of mortar by use of admixtures.
8. Remove all masonry determined to be frozen or damaged by freezing conditions.

3.7 Mortar:

1. Measure and batch materials either by volume or weight such that the required proportions for mortar can be accurately controlled and maintained. Measurement of sand exclusively by shovel will not be permitted.
2. Mix mortars with the minimum amount of water consistent with workability to provided maximum tensile bond strength within the capacity of the mortar.
3. Mix mortar ingredients for a minimum of 5 minutes in a mechanical batch mixer. Do not use mortar, which has begun to set, or if more than 2-1/2 hours has elapsed since initial mixing. Re-temper mortar during 2-1/2 hour period as required to restore workability.

**END OF SECTION**

**SECTION 05500****METAL WORK****PREFACE**

The general provisions of the Contract, including the Conditions of the Contract (General, Supplementary and other Conditions) and Division 1 as appropriate, apply to the Work specified in this Section.

**1.0 SCOPE**

- 1.2 Miscellaneous Metal(s) – (i.e. grills, etc.)

**2.0 MATERIALS**

- 2.1 Steel Tubular products shall be cold formed structural quality carbon steel, welded or seamless complying with ASTM A500 Grade B and the latest AISC Specifications for the design, fabrication and erection. All steel shall be domestic manufacture.
- 2.2 Bolts, nuts and washers shall conform to the Specifications, High-Strength Steel Bolts for Structural Joints, ASTM A325, latest edition.
- 2.3 Welding electrodes for manual shielded metal-arc welding shall conform to E70 series of the specifications for Mild Steel Arc-Welding Electrodes, ASTM A233, latest edition.

**3.0 EXECUTION**

- 3.1 Fabricate steel in conformity with the dimensions, arrangement, size and thickness that are shown or noted on the drawings. Workmanship and finish shall be first class and equal to the best practices in modern steel fabrication shop. Connections of all steel shall be detailed and fabricated in accordance with standards, specifications and details given in the latest editions of the Steel Construction Manual, issued by the American Institute of Steel Construction, unless specifically noted otherwise on the plans.
- 3.2 Shop connections, except as otherwise specifically shown on the drawings, shall be welded. Welding shall be done only by welders who hold valid qualification certificates under the qualification procedures of the American Welding Society. Except as otherwise shown or noted, welded connections shall be equal to framed beam connections in Table IV, Part 4, AISC Manual for Welded Equivalents.
- 3.3 Field Connection: Except as otherwise indicated on the drawings, all field connections shall be made by welding and/or high tensile strength bolts. All joints shall be assembled and the joining surfaces shall be tightly drawn together with fitting bolts before welding or permanent bolting is started. After assembly and before permanent

connection is done, the building framework shall be checked for alignment, plumbness, and level. Attention shall be given to the plumbing of all exposed members and those to which exposed construction work is to be attached, in order that accurate alignment on such construction will be maintained.

- 3.4 Welded connections shall be provided where designated by the drawings. All welding shall be done by the electric shielded arc method, and only by competent welders qualified as to their ability and experience under the requirements of the American Welding Society. Surfaces are to be clean and free from rust, scale, dirt, grease, paint, and other foreign matter. Edges of plates, angles and sections to be welded shall be closed by service bolting, clamping, jigs or tack welding. Welds shall be made of clean metal, free from inclusions or porosity. The contour of all welds shall have a smooth finish, and shall indicate good fusion with parent metal. Unless specifically stipulated otherwise, all welds shall be continuous along all contact edges and shall be of proper dimensions to develop the full strength of the thinnest sectional area involved in the connection.
- 3.5 All field-welded areas shall be power tool cleaned and painted in accordance with painting specs.

#### **END OF SECTION**

## SECTION 06100

### CARPENTRY AND MILLWORK

#### PREFACE

The general provisions of the Contract, including the Conditions of the Contract (General, Supplementary and other Conditions) and Division 1 as appropriate, apply to the Work specified in this Section.

#### 1.0 SCOPE

- 1.1 Labor, materials, equipment and appurtenant accessories for furnishing, fabricating and installing finish carpentry, millwork and cabinet work, as shown on the drawings and as specified. **\* No particle board shall be used for any type of construction or fabrication in this project.**
- 1.2 Trex Deck and TEX DOT sign board materials installed at sun screens and mechanical equipment screen. See plans for details

#### 2.0 MATERIALS

- 2.1 Lumber shall conform to American "Lumber Standards, Simplified Practice Recommendation R-16", latest edition, and to grading rules of manufacturer's association under whose rules it is produced. Lumber shall bear grade and trade mark of manufacturer's association. All lumber shall be dressed and kiln dried.
- 2.2 Hardwoods shall conform to current standards of the National Hardwood Lumber Association. All hardwoods shall be dressed and kiln dried.
- 2.3 Construction grade #1 fir shall be used for all nailing strips, ground, bucks and miscellaneous lumber less than 2" x 4" that is concealed from view.
- 2.4 WOOD TRIM: Furnish and install miscellaneous trim in sizes and locations where noted or required.
- 2.5 Trex Deck at sun screens: As manufactured by the TREX COMPANY, INC.

#### 3.0 EXECUTION

- 3.1 Protect finished woodwork from weather while in transit from point of production or fabrication to building. When delivered to site immediately place under cover and adequately protect from weather. DO NOT store in wet or damp portions of the building.

- 3.2 Furnish all nails, screws, spikes, bolts, hooks, hangers, anchors, ties, clips and other accessories required for the proper installation of the work under this Section. Anchors or other items required to be built in shall be furnished in ample time for building-in and the Contractor shall supervise their installation to insure proper location.
- 3.3 All work shall be built plumb, level, true and square to the lines and dimensions shown. Position of openings and offsets and slopes and angles shall be laid off with extreme care. All work shall be rigidly fastened as best suited for each condition as needed to permanently hold the finished work to correct surfaces, lines and levels.
- 3.4 FINISH CARPENTRY AND MILLWORK:
  - .1 Work shall be assembled at the mill insofar as practicable and delivered ready for erection. Work shall be made in accordance with approved shop drawings and measurements taken at the job. Execute work in the highest standards of the trade as regards to strength and appearance. To conform to the quality, grade, species, called for as "Custom Grade" as defined in Architectural Woodwork Institute "Quality Standards", Section 400.
  - .2 Deliver millwork and commence installation at job site at time established by the Contractor.
- 3.5 NAILERS, PLATES AND BLOCKING: Provide permanent dressed wood, nailers, plates and blocking of sizes indicated or required for attachment of work of other trades. Closely fit and accurately set members to required lines and levels rigidly secured in place.
- 3.6 INSTALLATION OF MILLWORK: Install members, plumb, true and square in accord with drawing requirements. Drill holes in hardwood for nails. Blind nail wherever possible with surface nails set. Make joints tight in an approved manner to conceal shrinkage. Set nails and countersink screws. Draw members tight against finished surfaces. Secure all interior finish trim with fine finishing nails and glue where required to assure permanent tight joints.
- 3.7 Woodwork which is to be painted shall have exposed surfaces free of defects that would show after being painted.
- 3.8 CLEAN UP: Clean up all debris caused by work in this Section keeping premises neat and clean at all times.

## **TREX CONSTRUCTION**

#### **4.1 MATERIALS**

**This product is made from 95% recycled materials including plastic shopping bags, reclaimed wood and sawdust.**

Use Trex 1" x 6" Square Edge Board (Actual dimensions...1" x 5.5") with smooth side out.

Submit samples for color selection by Architect

#### **4.2 EXECUTION (See details 5 Sheets A 4.2, A 4.4 and detail 3 A3.1)**

Trex materials are heavier and more flexible than wood. DO NOT try to lift the same Quantity of Trex boards as you would traditional lumber.

It is recommended that a carbide tipped blade be used for cutting.

Attach to steel frame with stainless steel through bolts, washers and nuts as noted  
In details

##### **GENERAL TIPS:**

- + Do not use permanent marking chalk lines and string. Use Irwin Straight Line "Dust Off" Marking Chalk
- + Do not sand surface
- + When drilling holes, periodically lift the drill bit out of the hole to remove the shavings
- + Store product on a flat and level surface
- + Do not stack over six bundles high
- + Cover material on job site until ready to install.

**END OF SECTION**

**SECTION 07200****INSULATION****PREFACE**

The general provisions of the Contract, including the Conditions of the Contract (General, Supplementary and other Conditions) and Division 1 as appropriate, apply to the Work specified in this Section.

**1.0 SCOPE**

- 1.1 This Section includes Rigid Insulation at roof of LIGHT MONITOR(Alternate No. 1) and blanket type insulation at locations as noted on drawings. Full Batt insulation at all Toilet Room walls and walls between Meeting Room and adjoining spaces.

**2.0 MATERIALS**

- 2.2 Foam joints at window and door frames and use foam gaskets at electrical cover plates.
- 2.3 Friction fit sound blankets between studs in designated wall cavities.
- 2.4 R-19 rigid roofing insulation adhered to decking per manufacture's recommendations. See Arch details for installation including 1/2" perlite board over top of rigid insulation.

**3.0 EXECUTION**

- 3.1 Extend insulation full thickness as indicated over entire roof area to be insulated. Cut and fit tightly around obstructions, and fill voids with insulation.
- 3.2 Exercise care to maintain an effective vapor barrier; patch punctures with foil tape. Remove and replace all torn or water soaked insulation.
- 3.3 Inspect final work to insure no insulation has been removed to accommodate other trades.

**END OF SECTION**

## **SECTION 07532**

### **SINGLE PLY ROOFING –CSPE**

#### **LIGHT MONITOR (Alternate No. 1)**

#### **PART 1 - GENERAL**

##### **1.01 RELATED DOCUMENTS**

**A.** Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections.

**B.** Related Sections include the following:

1. Section 07600 Flashing and Sheet Metal

##### **1.02 DESCRIPTION OF WORK**

**A.** This section includes all material, labor, equipment, temporary protection and tools for the proper installation and completion of the work as required in this specification.

**B.** The following items are specified in this section:

1. Roof Insulation
2. Fasteners
3. Roof membrane
4. Roof membrane flashings
5. Treated Wood
6. Sealants
7. Adhesives

##### **1.04 SUBMITTALS**

**A. Product Data:** Submit manufacturer's technical product data, installation instructions and recommendations for each type of roofing product required. Include data substantiating that materials comply with the specified requirements.

**C.** Submit copy of the membrane manufacturer's warranty covering materials.

**D.** Submit copy of the Roofing Contractor's warranty covering workmanship.

**G.** Submit written documentation from the manufacturer that the proposed roofing system including insulation and fasteners are compatible and meet the applicable requirements and code approvals as referenced in this specification and that the roofing system meets the requirements for the manufacturers standard warranty covering material.

**J.** Submit manufacturer's documentation of Energy Star labeled roofing materials.

**K.** Submit Material Safety Data Sheets (MSDS) and manufacturer's documentation of Volatile Organic Compound (VOC) content for each adhesive and sealant product.

### **1.05 QUALITY ASSURANCE**

**A.** Roofing system shall be applied only by an approved Contractor authorized prior to bid by the roof membrane manufacturer. Prior to bid, the Roofing Contractor must have completed a minimum of 500 roofing squares of CSPE membrane in the Southwest. To qualify for this requirement, the completed membrane must have met all conditions to obtain material and labor warranty, and must be performing successfully.

**C.** There shall be no deviation from this specification or the approved shop drawings without prior written approval by the manufacturer and the Sandia Delegated Representative (SDR).

**D.** Code Requirements: The proposed roofing system shall meet the requirements of the following recognized code approval or testing agencies. These requirements are minimum standards and no roofing work shall commence without written documentation of the system's compliance, as required in Section 01300 "Submittals."

1. Underwriters Laboratories (UL) Class A membrane.
2. Factory Mutual (FM) 1-60 or 1-90 uplift rating, as indicated on Contract Documents per FM Approval Standard No. 4470.

**E.** Energy Star Roof Compliance: The proposed roofing system shall be Energy Star Roof-compliant and roofing materials shall be Energy Star labeled.

**F.** For new installations, ponding shall not occur in accordance with NRCA Roofing and Waterproofing Manual good roof design practice, which dictates that there shall be no ponding water present 48-hours after rainfall.

### **1.06 DELIVERY, STORAGE, AND HANDLING**

**A.** All products delivered to the job site shall be in the original unopened container or wrappings.

**B.** Membrane rolls and insulation shall be stored fully protected from moisture and wind damage. Remove plastic from insulation and cover with tarpaulins on a raised surface.

**C.** Bonding adhesives shall be stored at temperatures recommended by the manufacturer.

**D.** Handle all materials to prevent damage. Any materials which are determined damaged, according to the SDR, are to be removed from the job site and replaced at no cost to Sandia National Laboratories (SNL).

### **1.07 PROJECT CONDITIONS**

**A.** Construction may not be fully represented on the drawings, and some modifications to details may be required to accomplish the intent of the documents.

Contractor shall ascertain to his satisfaction, coordinate with General Contractor and other sub-contractors prior to bidding, that the specifications and drawings are workable and that they are not in conflict with the manufacturer's requirements for a material warranty.

**B.** All work shall be scheduled and executed without exposing the interior building areas to the effects of inclement weather. The building and its contents shall be protected against all risks, and any damages shall be repaired or replaced at no cost to SNL. All exterior lighting, equipment, landscaping and paving shall be protected from damage.

**D.** Only as much of the new roofing as can be made weather tight each day including all flashing work, shall be installed.

**E.** All surfaces to receive insulation, membrane or flashing shall be thoroughly clean and dry. Should surface moisture occur, the Contractor shall provide the necessary equipment and labor to dry the surface prior to application.

**F.** All construction, including equipment and accessories, shall be secured against wind blow-off damage.

**G.** Temporary waterstops shall be installed at the end of each day's work and shall be removed before proceeding with the next day's work. Waterstops shall be compatible with all materials, shall not emit dangerous or incompatible fumes, and shall be installed per manufacturer's recommendations.

**H.** Contractor shall provide all necessary protection and barriers to segregate the work area and to prevent damage to adjacent areas. Plywood protection shall be provided for all new and existing roof areas which receive traffic during construction.

**I.** Prior to and during applications, all dirt, debris and dust shall be removed from surfaces either by sweeping or vacuuming. Compressed air cleaning is prohibited.

**J.** Liquid materials such as solvents and adhesives shall be stored and used away from open flames, sparks and excessive heat.

**K.** Membranes and accessories shall not be exposed to a prolonged temperature in

excess of 160 degrees F (71 degrees C).

**L.** Contaminants, such as grease, fats, oils and solvents shall not be allowed to come into direct contact with the roofing membrane. Any exposures shall be presented to the membrane manufacturer for assessment of impact on the roof system performance.

**M.** Site clean-up, including both interior and exterior building areas below or adjacent to or in any way affected by the construction of the roof, shall be complete. Cleaning of the membrane with gasoline is prohibited. Only cleaners approved by the roof membrane manufacturer and the SDR shall be used to clean the membrane. Notify the SDR before using any solvent or cleaner to allow intake fans to be shut down.

**N.** All roofing, insulation, flashings, and metal work removed for construction shall be promptly taken off the site to a legal dumping area.

**O.** After exposure to sunlight for 24-hours or longer, the membrane may have achieved a "surface" curing. Prior to hot-air welding, an application of manufacturer's recommended primer is required to achieve a proper weld. The need for primer is determined by a test weld in the presence of the SDR.

**P.** Contractor shall take care during application and storage that overloading of deck and structure does not occur.

**Q.** Precautions shall be taken when using adhesives at or near rooftop vents or air intakes. Coordinate closing or shut-offs of vents and air intakes during roofing and flashing operations.

## **1.08 WARRANTY**

**A.** Upon completion of construction, the manufacturer's ten (10) year warranty covering materials shall be issued to SNL.

**B.** Roofing Contractor shall supply SNL with a minimum two (2) year workmanship warranty. In the event any work related to roofing, flashings, or metal work is found to be defective or otherwise not in accordance with the Contract Documents within two (2) years of final acceptance, the Roofing Contractor shall remove and replace the defects at no cost to SNL.

## **PART 2 - PRODUCTS**

### **2.01 GENERAL**

Provide an insulated roofing system that is comprised of fully compatible components for use in the proposed application. All proposed materials shall be compatible with substrate.

### **2.02 MEMBRANE**

CSPE: Polyester scrim reinforced chlorosulfonated polyethylene (CSPE) sheet conforming to the following minimum physical properties:

#### **Property ASTM Test Method Specification**

Color White

Weight D751 0.29 lb/ft<sup>2</sup> (1.41 kg/m<sup>2</sup>)

Nominal Thickness (min.) D751 0.060"-inch (1.5mm)

Tolerance Thickness (min.) D751 + 10 %

Breaking Strength (min.) D751 (Grab Method) 225 lbf (1.0 kN)

Elongation (min.) D751 25 %

Tear Resistance (min.) D751 (Tongue Method) 90 lbf (400 N)

Ozone Resistance (min.) D1149 Pass

Low Temperature Flexibility D2136 Pass

Heat Aging D573 Maintains 100 % of  
Breaking Strength

Volatility, Max Loss D1203, Method A 0.5 %

Hydrostatic Resistance D751, Method A 300 psi (2.1 Mpa)

Shore A Hardness D2240 80 + 5

Puncture Resistance FTM 101B, Method 2031 200 lbf (900 N)

Dimensional Stability (max.) D1204 0.1 %

Emmaqua Concentrated Natural

Sunlight, 3 million Langley's

E838 No visible surface

cracking or stiffening

Change in Weight After Immersion in  
Water (max.)

D570 +3.0%

Initial Solar Reflectance (min.) E903 0.65

3-year aged Solar Reflectance (min.) E903 0.50

Emissivity (min.) E408 0.90

### **2.03 FLASHING MEMBRANE**

Flashing membrane shall be as supplied by the roofing membrane manufacturer.

Flashing membranes are generally the same material as the roofing membrane unless otherwise specified in the Contract Documents. Unreinforced 0.055"-inch (1.4 mm) minimum thick, uncured, white CSPE shall be used for round flashings and corners.

## 2.04 INSULATION

**A. General:** Provide insulating materials to comply with referenced standards and requirements indicated for materials; provide manufacturer's standard thicknesses, in size to fit applications.

1. Fully Adhered Systems: Provide no greater than 4'-foot x 4'-foot (1.2m x 1.2m) boards.
2. Mechanically Fastened Systems: Provide 4'-foot x 8'-foot (1.2m x 2.4m) boards.

**B. Polyisocyanurate Board Roof Insulation:** Furnish and install rigid, cellular thermal insulation with polyisocyanurate closed-cell foam core and manufacturer's standard facing laminated to both sides to comply with FS HH-I-1972/2 Class 1. Provide in two (2) layers for a total thickness to meet an average R-value of 30.0, unless otherwise indicated in the Contract Documents.

Surface Burning Characteristics: Comply with ASTM E84 with a maximum flame spread and smoke developed values of 25 and 145, respectively.

Recycled Content: Minimum 9 percent.

**C. Insulation, fasteners and adhesive** shall be supplied or approved by the roof membrane manufacturer for compatibility with the system and the required FM and UL requirements. Adhesives shall comply with VOC limits of California South Coast (AQMD), Rule #1168.

**D. Recovery Board:** Provide one-half inch (1/2"-inch, 13mm) Den's Deck, or approved equal, over all insulation and tapered insulation.

## 2.05 ACCESSORY PRODUCTS

**A. Flashing Adhesive:** As specified by the membrane manufacturer to comply with VOC limits of California South Coast (AQMD), Rule #1168. Adhesives containing carcinogens shall be limited to vertical surfaces and flashings.

**B. Wood Nailers:** Treated wood nailers shall be installed at the perimeter of the entire roof and around such other roof projections and penetrations as specified on the Contract Documents. Wood shall be #2 or better, treated fire retardant lumber. Creosote and asphaltic preservatives are prohibited. Height of nailers shall match that of the insulation thickness or as indicated on the drawings. Nailers shall be firmly anchored at a maximum spacing of 12"-inches (305mm) unless noted otherwise on drawings and capable of resisting a force of 300 pounds per lineal foot (446 kg per meter) in any direction. One-half inch, (1/2"-inch, 13mm) expansion spaces shall be provided between lengths of nailers.

**D. Sealants:** As recommended by the membrane manufacturer to comply with California South Coast (AQMD), Rule #1168.

**E. Miscellaneous Fasteners and Anchors:** In general, all fasteners, anchors, nails and straps shall be of zinc-coated steel, galvanized, or stainless steel and cadmium-free. All fasteners and anchors shall have a minimum embedment of 1-1/2"-inch (38mm) and shall be approved for such use by the fastener manufacturer and the membrane manufacturer.

**F. Sheet Metal Accessory Materials:** ASTM A653, with 0.20 percent copper, G90 hot-dipped galvanized, 24-gauge (0.61mm) or heavier.

**G. Expansion Joint Covers:** Shall be the manufacturer's prefabricated units of the same material as the roof membrane.

**H. Perimeter Edge Metal:** Shall be supplied by the membrane manufacturer and coated with the same material as the roofing membrane and shall be compatible with the roofing membrane for hot-air welding.

**I. Slip Sheet:** Provide only when needed between incompatible materials. Use membrane manufacturers standard slip sheet material.

**J. Base Sheet:** Provide membrane manufacturers recommended vented base sheet on all types of concrete decks or when required or recommended by membrane manufacturer for the intended application.

**K. Vapor Barrier:** Provide membrane manufacturer's recommended Kraft paper vapor barrier between all metal decks and insulation when indicated on Contract Documents or recommended by membrane manufacturer.

**L. B-Line Rooftop Supports or approved equal.** To be placed at a minimum of 10'-feet (3m) on center for proper support. Refer to SNL Standard Detail Drawing for rooftop supports, AE5035 and AE5036.

## **PART 3 – EXECUTION**

### **3.01 INSPECTION**

**A.** Prior to all work of this section, Contractor shall carefully inspect the installed work of all other trades and verify that all such work is complete to the point where this installation may properly commence.

**B.** Verify that work of other trades that penetrate the roof deck has been completed.

**C.** Verify that roofing system may be installed in strict accordance with all pertinent codes and regulations, the original design and the manufacturer's recommendations.

**D.** In the event of discrepancy, immediately notify the SDR.

**E.** Do not proceed with installation in areas of discrepancy until all such discrepancies have been fully resolved.

**F.** Upon starting the installation of a new roof, the SDR, General Contractor and Sub-Contractor (if applicable), will designate a portion of the installation to be used as a mock up. This area will be the model of how the roof installation shall be installed. All concerns with the remainder of the installation shall refer back to the installation of the agreed upon mock up. The mock up should include the insulation, a curb, flashing, parapet and an inside and outside corner along with a termination and lap seam.

**G.** Throughout the project and at completion, the SDR shall be allowed to inspect the roof, including probing, as necessary to ensure proper installation.

### **3.02 PREPARATION OF SUBSTRATE**

**A.** General: Comply with the insulation and membrane manufacturer's instructions for preparation of the substrate to receive the roofing system.

**B.** Clean substrate of dust, debris, and other substances detrimental to the system work. Remove sharp projections.

**C.** Notify the SDR to inspect the substrate. Contractor shall not proceed with installation until the SDR has approved the substrate.

### **3.03 INSTALLATION OF INSULATION**

**A.** Insulation shall be installed according to the insulation manufacturer's instructions and shall be approved by the SDR and membrane manufacturer.

**B.** Insulation shall be neatly cut to fit around all penetrations and projections.

**C.** Install tapered insulation where applicable in accordance with insulation manufacturer's approved shop drawings in order to achieve the specified slope.

**D.** Do not install more insulation board than can be covered with membrane by the end of the day, or onset of inclement weather.

**E.** Attachment

1. Insulation shall be fully adhered to the deck with approved adhesives at a rate and pattern acceptable to Factory Mutual's and membrane manufacturer's requirements for fastening rates and patterns.

2. Fasteners and adhesives are to be installed in accordance with the fastener manufacturer's recommendations. Fasteners are to have a minimum penetration into the structural deck as recommended by the fastener manufacturer and membrane manufacturer. Fasten only in top of ribs of metal deck, not flutes.

3. Perform pull out tests for the SDR to verify deck conditions and actual pull out values prior to installation of the membrane.

4. Use fastener tools with a depth locator as recommended or supplied by the fastener manufacturer to ensure proper installation.
5. All joints and seams shall be a tight fit to prevent any gaps, voids and surface irregularities.

### **3.04 INSTALLATION OF MEMBRANE**

- A.** Install materials in accordance with manufacturers instructions for the intended application.
- B.** Surface of the insulation shall be inspected prior to installation of the roof membrane. The insulation surface shall be clean and smooth with no excessive surface roughness, contaminated surfaces, or unsound surfaces such as broken or delaminated insulation boards.
- C.** Membrane shall be installed per the membrane manufacturer's written installation procedures for an approved mechanically fastened or fully adhered system.
- D.** No bonding adhesive shall be applied to lap areas that are to be welded to flashing or adjacent sheets. All sheets shall be applied in the same manner, lapping all sheets as required by welding techniques. No peel and stick products allowed.
- E.** Any repairs or patches shall be hot-air welded. No peel and stick products allowed.
- F.** Adjacent sheets shall be welded in accordance with the manufacturer's written instructions. All side and end lap joints shall be hot-air welded. Lap area shall be a minimum of 3"-inches (76mm) wide when machine welding, and a minimum of 4"- inches (102mm) wide when hand welding. No adhesive shall be present within the lap areas.
- G.** Hand and machine welding shall be carried out per the manufacturer's written instructions. All mechanics intending to use the welding equipment shall have successfully completed a course of instruction provided by a manufacturer's representative prior to welding. All welding equipment must be approved by the manufacturer prior to use.
- H.** All completed seams shall be checked by the Contractor after cooling for continuity using a screwdriver or suitable blunt instrument. In addition, on-site evaluation of welded seams shall be made by Contractor at locations as directed by the SDR or membrane manufacturer's representative. Contractor shall provide 2"-inch (51mm) wide cross-sectional samples taken through completed seams. Approximately two samples will be taken per 100 roofing squares. Correctly welded seams display failure from shearing of the membrane prior to separation of the weld. Each test cut shall be patched by the Contractor at no additional charge to SNL.
- I.** Exposed or cured membrane shall be hot-air welded per manufacturer's instructions.
- J.** During the course of the work, the entire roof area shall be kept clear of loose or

spilled fasteners and metal scraps to guard against accidental puncture of the membrane.

### **3.05 MEMBRANE FLASHINGS**

**A.** All flashing shall be installed concurrently with the roof membrane as the job progresses. No temporary membrane flashings shall be allowed without the prior written approval of the SDR. Approval shall only be for specific locations on specific dates.

**B.** All flashing membranes shall be fully adhered to substrates. All interior and exterior corners and miters shall be cut and hot-air welded in place, or prefabricated corners and miters may be used. Bituminous elements shall not be in contact with non-compatible membrane. Manufacturers recommended isolator shall be used to isolate non-compatible membrane flashing from bituminous coated elements such as vent stacks and pipes penetrating the roof.

**C.** All flashings shall be hot-air welded at their joints and at their connections with the roof membrane. No peel and stick products allowed.

**D.** Pipe penetrations shall be flashed a minimum of 8"-inches (203mm) above the roofing membrane, and terminate with a stainless steel hose clamp with sealant applied along the top edge. Pipe should be isolated by membrane. Factory fabricated pipe seals and roof membrane shall be welded as outlined. A buffer layer of membrane shall be installed between hose clamp and flashing sheet to avoid damage.

**E.** All curb flashing membranes shall be mechanically fastened along the top using nails with 1"-inch (25mm) diameter heads spaced a maximum of 6"-inches (152mm) on center, or predrilled metal strips. All roof edge flashings shall be hotair welded to the membrane manufacturer's coated metal. Predrilled metal strips shall be caulked along the top edge with a sealant. Expansion pins with nylon sheaths set in predrilled holes shall be used to secure flashings to masonry and concrete surfaces. Reglets shall be used on walls as shown on the Contract Documents.

**F.** Edge metal shall be supplied by the membrane manufacturer and shall be coated with the same material as the roofing membrane. The edge metal and membrane strips joining each piece of edge metal shall closely match the color of the building perimeter, unless specified elsewhere on the Contract Documents or by the SDR.

### **3.06 TEMPORARY CUTOFF**

**A.** Flashings shall be installed concurrently with the roof membrane in order to maintain a watertight condition as the work progresses. When a break in the day's work occurs in the central area of the roof, a temporary waterstop shall be constructed to provide a watertight seal.

1. Waterstop shall be installed per the manufacturer's recommendations and per details shown on the Contract Documents.

2. When work on the new system is suspended, the stagger of the insulation joints shall be maintained by installing partial fillers. New membrane shall be carried into the waterstop.

3. When work resumes, the contaminated membrane, insulation fillers, etc., shall be removed from the work area and disposed off-site. Do not reuse these materials in new work.

**B.** If inclement weather occurs while a temporary waterstop is in place, the Contractor shall provide the labor necessary to monitor the situation to maintain a watertight condition.

### **3.08 COMPLETION**

**A.** At completion of construction and prior to Contractor's request for final inspection by SDR, membrane manufacturer's technical consultant shall provide on-site inspection of installed roofing system.

1. Membrane manufacturer shall provide Contractor and SDR with itemized list of defects or non-compliance with manufacturer's recommendations.

2. Contractor shall immediately correct identified items. Complete corrections before request for final inspection from SDR.

**B.** Prior to demobilization from site, work shall be reviewed by SDR and Contractor.

1. Itemize defects or non-compliance with these specifications or membrane manufacturer's recommendations in punch list.

2. Contractor shall immediately correct identified items prior to demobilization, to satisfaction of SDR and membrane manufacturer.

### **END OF SECTION**

**SECTION 07600****FLASHING & SHEET METAL****PREFACE**

The general provisions of the Contract, including the conditions of the Contract (General, Supplementary and other Conditions) and Division 1, as appropriate, apply to the Work specified in this section.

**1.0 SCOPE**

- 1.1 This Section includes flashing and sheet metal required to prevent penetration of water through the exterior shell of the building. Prefinished metal edges, gutters, counter flashing and expansion joints shall be supplied by the prime material manufacturer and included in the roof system warranty. Drawings and general provisions of contract apply to this section.

**1.2 Quality Assurance:**

- A. Qualifications of Installers: At least one person shall be present at all times during execution of this work who is thoroughly trained and experienced in the materials and methods required to fabricate and install the flashing and sheet metal work specified herein.
- B. Codes and Standards: Comply with all pertinent codes and regulations.

**1.3 Codes and Standards:**

- A. Comply with all pertinent codes and regulations.
- B. Comply with all pertinent recommendation of 1988 edition of "Architectural Sheet Metal Manual" of the Sheet Metal and Air Conditioning Contractors National Association, Inc. (SMACNA)

**1.4 Submittals**

- A. Product Data: Submit manufacturer's product specifications, installation instructions and general recommendations for each specified sheet material and fabricated product.
- B. Submit two (2)12" long completely finished units of specified factory-fabricated products exposed as finished work.
- C. Shop Drawings: Submit shop drawings for review showing layout, joining, profiles, and anchorage of fabricated work, including major counter flashings, trim/fascia units.

**1.5 Product Handling**

- A. Protection: Protect flashing and sheet metal materials before and during installation.
- B. Replacements: In event of damage, make all repairs and replacements necessary.

## 2.0 MATERIALS

### 2.1 Materials and Gauges

- A. Where sheet metal is required and no material or gauge is indicated, furnish and install the highest quality and gauges commensurate with referenced standard.
- B. Sheet Metal: 24 gauge G90, galvanized with a Kynar 500 factory applied finished color to match the adjacent roof or wall panels.
- C. Lead Flashings: Sheet complying with FS QQ-L-201. Grade B; formed from Common Desilverized Pig Lead complying with ASTM B29. Weight 4.0 lbs./sq./ft. unless otherwise specified.

### 2.2 Nails, Rivets and Fasteners

- A. Annular Threaded Nails: Galvanized
- B. Rivets: Soft iron having rust resistive coating.
- C. Exposed Fasteners and Washers: Stainless Steel with neoprene washers.
- D. Masonry Anchors: Lead or Nylon where appropriate.
- E. Caulking: Terpolymer by the Garland Company or approved equal.

### 2.3 Related Material

- A. Flux: For use with galvanized iron or steel: Raw Muriatic Acid
- B. Solder: Conform with current ASTM B-32. 50% tin and 50% lead.
- C. Burning Rod for Lead: Same composition as lead
- D. Termination Bar: Aluminum slotted bar.

## 3.0 EXECUTION

### 3.1 Examination

- A. Verify all existing work is complete to point where this installation may commence.

- B. In the event of discrepancy, notify owner's representative. Do not proceed until discrepancies have been resolved.
- C. Field measure site conditions prior to fabricating work.

### 3.2 Fabrication

- A. Shop fabricate work to greatest extent possible. Comply with details shown, and with applicable requirements of SMACNA and other industry practices.
- B. Fabricate for waterproof and weather-resistant performance: with expansion provisions for running work, sufficient to permanently prevent leakage, damage or deterioration of work.
- C. Form exposed sheet metal work without excessive oil canning, buckling and tool marks, true to line and levels as indicated, with exposed edges folded back to form hems.
- D. All miters shall receive rivets. All joints or where metal overlaps shall receive Terpolymer sealants. This includes back up plates as well as cover plates.

### 3.3 Lead Flashing Installation

- A. Set all primed leads in a bed of roofing mastic. At pipe vents, turn lead down into pipe opening a minimum of 1 inch and crimp.

### 3.4 Fabrication Counter Flashing

- A. Fit flashing tight in place, making corners square surfaces true and straight in plane and accurate to profile.
- B. Secure counter flashing through butyl tape onto wall with lead anchors.
- C. Fill caulk through with Terpolymer caulking.

### 3.5 Fabrication Copping Cap

- A. Shop-fabricate work to greatest extent possible. Comply with details shown, and with applicable requirements of SMACNA and other industry practices.
- B. Fabricate for waterproof and weather resistant performance; with expansion provisions for running work, sufficient to permanently prevent leakage, damage or deterioration of work.
- C. Form exposed sheet metal work without excessive oil-canning, buckling and tool marks, true to line and levels as indicated, with exposed edges folded back to form hems.

- D. All miters shall be soldered. All joints or where metal overlaps shall receive Terpolymer sealant. This includes back up plates as well as cover plates.

3.6 Cleaning

- A. Clean exposed metal surface removing substances which might cause corrosion of metal or deterioration of finishes.

**END OF SECTION**

**SECTION 07610****PREFORMED METAL ROOFING & WALL PANELS****PREFACE**

The general provisions of the Contract, including the Conditions of the Contract (General, Supplementary and other Conditions) and Division 1 as appropriate, apply to the Work specified in this Section.

**1.01 SECTION INCLUDES**

- A. Preformed, **Galvalume "S-Panel" metal roofing** and flashings at shade structures.
- B. Preformed **Galvalume "HR-16" wall panels**
- B. Miscellaneous trim, flashing, closures, drip flashing and accessories.
- C. Sealant
- D. Fastening devices.

**1.02 RELATED SECTIONS**

- A. Section 05120: Structural Steel Framing.
- B. Section 05500: Miscellaneous metal fabrication.
- C. Section 06100: Rough Carpentry.
- D. Section 07631: Flashing and Sheet Metal Gutters.
- E. Section 07900: Sealants.

**1.03 REFERENCES**

- A. American Iron & Steel Institute (AISI) Specification for the Design of Cold formed Steel Structural Members.
- B. ASTM A-525 Steel Sheet, Zinc-Coated (Galvanized)
- C. ASTM E-1680
- D. ASTM E-1646
- E. ASTM E-1592
- E. Spec Data Sheet - Aluminum Zinc Alloy Coated Steel (Galvalume) Sheet Metal by Bethlehem Corp.
- F. SMACNA - Architectural Sheet Metal Manual.
- G. Building Materials Directory - Underwriter's Laboratories, Test Procedure 580.

**1.04 ASSEMBLY DESCRIPTION**

- A. The roofing assembly includes preformed Galvalume sheet metal panels, related accessories, valleys, hips, ridges, eaves, corners, rakes, miscellaneous flashing and attaching devices.
- B. The wall panel assembly includes preformed Galvalume Berridge HR-16 corrugated metal panels.

**1.05 SUBMITTALS**

- A. Submit detailed drawings showing layout of panels, anchoring details, joint details, trim, flashing, and accessories. Show details of weatherproofing, terminations, and penetrations of metal work.
- B. Submit a sample of each type of roof and wall panel, complete with factory finish.
- C. Submit results indicating compliance with minimum requirements of the following performance tests:
  - 1. Air Infiltration     ASTM E 1680
  - 2. Water Infiltration   ASTM E 1646
  - 3. Wind Uplift - U.L.90
- D. Submit calculations with registered engineer seal, verifying roof and wall panel and attachment method resists wind pressures imposed on it pursuant to applicable building codes.

#### **1.06 QUALITY ASSURANCE**

- A. Manufacturer: Company specializing in Architectural Sheet Metal Products with ten (10) years minimum experience.
- B. No product substitutions shall be permitted without meeting specifications.
- C. Substitutions shall be submitted 10 Days prior to Bid Date and acceptance put forth in an addendum.
- D. No substitutions shall be made after the Bid Date.

#### **1.07 DELIVERY, STORAGE AND HANDLING**

- A. Upon receipt of panels and other materials, installer shall examine the shipment for damage and completeness.
- B. Panels should be stored in a clean, dry place. One end should be elevated to allow moisture to run off.
- C. Panels with strippable film must not be stored in the open, exposed to the sun.
- D. Stack all materials to prevent damage and to allow for adequate ventilation.

#### **1.08 WARRANTY**

- A. Paint finish shall have a twenty year guarantee against cracking, peeling and fade (not to exceed 5 N.B.S. units).
- B. Galvalume material shall have a twenty year guarantee against failure due to corrosion, rupture or perforation.
- C. Applicator shall furnish guarantee covering water-tightness of the roofing system for the period of two (2) years from the date of substantial completion.

### **PART 2 PRODUCT**

#### **2.01 ACCEPTABLE MANUFACTURERS**

- A. Berridge Manufacturing Company, Houston, Texas.
- B. Substitutions shall fully comply with specified requirements.

## 2.02 SHEET MATERIALS

- A. Prefinished Metal shall be pre-finished Galvalume 24 Gauge core steel - ASTM 792-86 AZ-55 .
- B. Unfinished Metal shall be Grade C Aluminum Zinc Alloy Coated Steel ASTM 792-86, AZ 55, "Satin Finish".
- C. Finish shall be Pre-weathered Galvalume coating, applied by the manufacturer on a continuous coil coating line, with a top side dry film thickness of 0.70 to 0.80 mil over 0.20 to 0.30 mil prime coat, to provide a total topside dry film thickness of 1.0 plus or minus 0.10 mil. Reverse side shall be coated with primer and wash coat of 0.30 mil plus or minus 0.05 mil. Finish shall conform to all tests for adhesion, flexibility, and longevity as specified by the Kynar 500® PVDF resin-based coating supplier.
- D. Strippable film shall be applied to the top side of the painted coil to protect the finish during fabrication, shipping and field handling. This strippable film must be removed immediately before installation.

## 2.03 ACCESSORY MATERIALS

- A. Fasteners: Galvanized Steel with washers where required.
- B. Sealant: Sealant must be an ultra low modulus, high performance, one-part, moisture curing silicone joint sealant. (do not use a clear sealant or sealants which release a solvent or acid during curing).

Sealant must be resistant to environmental conditions such as wind loading, wind driven rain, snow, sleet, acid rain, ozone, ultraviolet light and extreme temperature variations.

Features must include joint movement capabilities of +100% & -50% ASTM C-719, capable of taking expansion, compression, transverse and longitudinal movement, service temperature range -65°F to 300°F (-54°C to 149°C), Flow, sag or slump: ASTM C-639; Nil, Hardness (Shore A): ASTM C-661; 15, Tensile strength at maximum elongation: ASTM D-412; 200 psi, Tensile strength at 100% elongation: ASTM D-412; 35 psi, Tear strength, (die "C"); ASTM D-624; 40 pli, Peel strength (Aluminum, Glass, Concrete): ASTM C-794; 30 pli

- C. Vinyl Weatherseal Insert.

## 2.04 FABRICATION

- A. All exposed adjacent flashing shall be of the same material and finish as the roof panels.
- B. Hem all exposed edges of flashing on underside, 1/2 inch.

## 2.05 PREFORMED METAL PANELS

### BERRIDGE HR-16 WALL PANEL

- 1. Panel coverage width to be 16", with a panel depth of 7/8".
- 2. Ribs to be spaced 4" on center.
- 3. Panels to be of interlocking design with concealed fasteners.

## PART 3 EXECUTION

**3.01 INSPECTION****A. Substrate:**

1. Dens glass with "Ice and Water Shield" over 6" metal studs
2. Inspect framing to verify free of depressions, waves or projections, level to 1/4" in 20'
3. Verify openings, curbs, pipes, sleeves, ducts or vents through wall are solidly set.

**B. Underlayment:**

1. Ensure that all nail heads are totally flush with the substrate.

**3.02 INSTALLATION**

- A. Comply with manufacturers standard instructions and conform to standards set forth in the Architectural Sheet Metal Manual published by SMACNA, in order to achieve a watertight installation.
- B. Install panels in such a manner that horizontal lines are true and level and vertical lines are plumb.
- D. Remove protective strippable film prior to installation of panels.
- E. Attach panels using manufacturer's standard clips and fasteners, spaced in accordance with approved shop drawings.
- F. Do not allow panels or trim to come into contact with dissimilar materials.
- G. Remove and replace any panels or components which are damaged beyond successful repair.

**3.03 CLEANING**

- A. Clean any grease, finger marks or stains from the panels per manufacturer's recommendations.
- B. Remove all scrap and construction debris from the site.

**3.04 FINAL INSPECTION**

- A. Final inspection will be performed by a firm appointed and paid for by the owner in accordance with section 01410.

**END OF SECTION**

## SECTION 07720 - ROOF ACCESSORIES

### PART 1 - GENERAL

#### 1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

#### 1.2 SUMMARY

- A. This Section includes the following:
  - 1. Ridge vents.
- B. Related Sections include the following:
  - 1. Division 7 Section "Sheet Metal Flashing and Trim" for shop- and field-fabricated metal flashing and counterflashing, scuppers, gutters and downspouts, fasciae, roof expansion-joint covers, valleys, and miscellaneous sheet metal trim and accessories.
  - 2. Division 7 Section "Manufactured Roof Specialties" for fasciae, copings, gravel stops, and roof expansion-joint covers.
  - 3. Division 7 Sections for roofing accessories included as part of roofing Work.

#### 1.3 SUBMITTALS

- A. Product Data: For each type of product indicated. Include construction details, materials, dimensions of individual components and profiles, and finishes.
- B. Shop Drawings: Show fabrication and installation details. Indicate dimensions, weights, loadings, required clearances, method of field assembly, and components. Include plans, elevations, sections, details, and attachments to other Work.
- C. Coordination Drawings: Roof plans drawn to scale and coordinating penetrations and roof-mounted items. Show the following:
  - 1. See drawings for size and location of unit.
  - 2. Method of recommended installation for existing ridge condition.
- D. Samples for Initial Selection: Manufacturer's color charts showing the full range of colors available for roof accessories with factory-applied color finishes.
- E. Samples for Verification: For each type of exposed finish required, prepared on Samples in manufacturer's standard sizes, and of same thickness and material indicated for the Work. If finishes involve normal color or shade variations, include sample sets showing the full range of variations expected.

## 1.4 QUALITY ASSURANCE

### A. Standards: Comply with the following:

1. SMACNA's "Architectural Sheet Metal Manual" details for fabrication of units, including flanges and cap flashing to coordinate with type of roofing indicated.
2. NRCA's "Roofing and Waterproofing Manual" details for installing units.

## PART 2 - PRODUCTS

### 2.1 MANUFACTURERS

#### A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

#### B. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

##### 1. Roof Curbs and Equipment Supports:

- a. AES Industries, Inc.
- b. Colony Custom Curbs.
- c. Commodity Products Company, Inc.
- d. Conn-Fab Sales, Inc.
- e. Curbs Plus, Inc.
- f. Custom Curb, Inc.
- g. Gieske Custom Metal Fabricators.
- h. Goeller Enterprises.
- i. LMCurbs.
- j. Loren Cook Company.
- k. Metallic Products Corporation.
- l. Pate Co.(The).
- m. Roof Products & Systems Corp.
- n. ThyCurb, Inc.
- o. Uni-Curb, Inc.
- p. Vent Products Co., Inc.
- q. Vent Products Co., Inc.
- r. Western Canwell.

##### 2. Ridge Vents:

- a. Air Vent, Inc.
- b. Alcoa Building Products.
- c. Commodity Products Company, Inc.
- d. Cor-A-Vent, Inc.
- e. GAF Materials Corporation.
- f. Klauer Manufacturing Co.
- g. Metallic Products Corporation.
- h. Mid-America Building Products Corporation.

- i. Niff-Corr, Inc.
- j. Obdyke: Benjamin Obdyke, Inc.
- k. Petersen Aluminum Corp.
- l. Plyco Corporation.
- m. Solar Group (The).
- n. ThyCurb, Inc.
- o. Trimco, Inc.
- p. Trimline Roof Ventilation Systems.
- q. Western Canwell.

## 2.2 MATERIALS, GENERAL

- A. Aluminum Sheet: ASTM B 209 for alclad alloy 3005H25 or alloy and temper required to suit forming operations, with mill finish, unless otherwise indicated.
- B. Extruded Aluminum: ASTM B 221 alloy 6063-T52 or alloy and temper required to suit structural and finish requirements, with mill finish, unless otherwise indicated.
- C. Galvanized Steel Sheet: ASTM A 653/A 653M with G90 coating designation; commercial quality, unless otherwise indicated.
  - 1. Structural Quality: Grade 40, where indicated or as required for strength.
- D. Aluminum-Zinc Alloy-Coated Steel Sheet: ASTM A 792/A 792M with Class AZ-50 coating, structural quality, Grade 40, or as required for strength.
- E. Fasteners: Same metal as metals being fastened, or nonmagnetic stainless steel or other noncorrosive metal as recommended by manufacturer. Match finish of exposed fasteners with finish of material being fastened.
- F. Gaskets: Manufacturer's standard tubular or fingered design of neoprene, EPDM, or PVC; or flat design of foam rubber, sponge neoprene, or cork.
- G. Mastic Sealant: Polyisobutylene; nonhardening, nonskinning, nondrying, nonmigrating sealant.
- H. Elastomeric Sealant: Generic type recommended by unit manufacturer that is compatible with joint surfaces; ASTM C 920, Type S, Grade NS, Class 25, and Uses NT, G, A, and, as applicable to joint substrates indicated, O.
- I. Roofing Cement: ASTM D 4586, nonasbestos, fibrated asphalt cement designed for trowel application or other adhesive compatible with roofing system.
- J. Fabrication: Unless otherwise indicated or required for strength, fabricate units from minimum 0.0747-inch- thick, structural-quality, hot-dip galvanized or aluminum-zinc alloy-coated steel sheet; factory primed and prepared for painting with welded or sealed mechanical corner joints.
- K. Fabrication: Unless otherwise indicated or required for strength, fabricate units from minimum 0.063-inch- thick, sheet aluminum with welded corner joints.
  - 1. On ribbed or fluted metal roofs, form flange at perimeter bottom to conform to roof profile.

## 2.3 RIDGE VENTS

- A. General: Ventilating ridge cap with ventilating mesh providing a minimum net free area of 18 sq. in./ft., of manufacturer's standard design.
  - 1. Aluminum: Fabricate from sheet aluminum with baffles to prevent snow and rain entering and with weep holes to allow water to drain to roof. Provide required splice plates and end caps.
    - a. Finish: Clear anodic.
    - b. Finish: Color anodic.
    - c. Finish: Baked enamel.
    - d. Finish: High-performance organic coating.

## PART 3 - EXECUTION

### 3.1 INSTALLATION

- A. General: Comply with manufacturer's written instructions. Coordinate installation of roof accessories with installation of roof deck, roof insulation, flashing, roofing membranes, penetrations, equipment, and other construction involving roof accessories to ensure that each element of the Work performs properly and that combined elements are waterproof and weathertight. Anchor roof accessories securely to supporting structural substrates so they are capable of withstanding lateral and thermal stresses, and inward and outward loading pressures.
- B. Install roof accessory items according to construction details of NRCA's "Roofing and Waterproofing Manual," unless otherwise indicated,
- C. Separation: Separate metal from incompatible metal or corrosive substrates, including wood, by coating concealed surfaces, at locations of contact, with bituminous coating or providing other permanent separation.
- D. Flange Seals: Unless otherwise indicated, set flanges of accessory units in a thick bed of roofing cement to form a seal.
- E. Ridge Vents: Install according to manufacturer's written instructions.

### 3.2 CLEANING AND PROTECTION

- A. Clean exposed surfaces according to manufacturer's written instructions. Touch up damaged metal coatings.

END OF SECTION 07720

**SECTION 07900****SEALANTS****PREFACE**

The general provisions of the Contract, including the conditions of the Contract (General, Supplementary and other Conditions) and Division 1, as appropriate, apply to the Work specified in this section.

**1.0 SCOPE**

- 1.1 This Section includes caulking and sealants.

**2.0 MATERIALS**

- 2.1 Exterior Silicon Rubber Sealant to be one-part elastomeric sealant, complying with FS TT-S-001543, Class A; recommended by manufacturer for exterior joints. Provide non-acid type wherever one or both joint faces are masonry, stone, concrete or other porous materials. Provide acid-type wherever both joint faces are metal, glass, plastic or other non-porous material.
- 2.2 For interior applications in wet areas and thresholds, provide butyl rubber sealant, polyisobutylene sealant (mastic) or silicon rubber sealant as above recommended by manufacturer for interior joints in wet areas, and when exposed, compounded specifically for mildew resistance.
- 2.3 Sealant for sheet metal flashing shall be one part polysulfide-base non-sag sealant conforming to Federal Specifications TT-s-00230C (2), Type II, Class A colored to match adjacent surfaces.
- 2.4 Provide ribbon or tape sealants, foam sealants, joint fillers, joint primer/sealers, bond breakers tape, and backer rod as necessary for proper execution of the work.
- 2.5 Exposed materials to be colored to match adjacent surfaces as approved by Architect.

**3.0 EXECUTION**

- 3.1 Examine sub-surfaces to receive work and report in writing any conditions detrimental to the work. Commencement of work will be construed as acceptance of all sub-surfaces.

- 3.2 Comply with manufacturer's written instructions except where more stringent requirements as shown or specified, and except where manufacturer's technical representative directs otherwise.

Employ proven installation techniques which will ensure that sealants will be deposited in uniform, continuous ribbons without gaps or air pockets, with complete "wetting" of the joint bond surfaces equally on opposite sides. Except as otherwise indicated, fill sealant rabbet to a slightly concave surface, slightly below adjoining surfaces. Where horizontal joints are between a horizontal surface and vertical surface, fill joint to form a slight cove, so that joint will not trap moisture and dirt.

- 3.3 Install sealants to depths as shown: if not shown, install as recommended by the sealant manufacturer but within the following limitations, measured at the center (thin) section of the bead:

- .1 For formal moving joints sealed with elastomeric sealants but not subject to traffic, fill joints to a depth equal to 50% of joint width, but neither more than 1/2" deep nor less than 1/4" deep.
- .2 For joints sealed with non-elastomeric sealants and caulking compounds, fill joints to a depth in the range of 75% to 125% of joint width.

- 3.4 Do not allow sealants or compounds to overflow or spill onto adjoining surfaces or to migrate into the voids of adjoining surfaces. Clean the adjoining surfaces by whatever means necessary to eliminate evidence of spillage.

#### **END OF SECTION**

## **SECTION 08400**

### **ENTRANCES AND STOREFRONTS**

#### **PART 1 GENERAL**

##### **1.1 SECTION INCLUDES**

**A.** Aluminum entrances and storefronts.

##### **1.2 RELATED SECTIONS**

**A.** Section 07920 - Sealants: Sealant product and installation requirements.

**B.** Section 08810 - Glass and Glazing: Glass and glazing requirements.

##### **1.3 REFERENCES**

**A.** ASTM B 209 - Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate.

**B.** ASTM B 221 - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes.

**C.** ASTM B368 - Standard Method for Copper-Accelerated Acetic Acid-Salt Spray (Fog) Testing (CASS Test).

**D.** ASTM C 236 - Standard Test Method for Steady-State Thermal Performance of Building Assemblies by Means of a Guarded Hot Box.

**E.** ASTM C 864 - Standard Specification for Dense Elastomeric Compression Seal Gaskets, Setting Blocks, and Spacers.

**F.** ASTM E 283 - Standard Test Method for Determining Rate of Air Leakage Through Exterior Windows, Curtain Walls, and Doors Under Specified Pressure Differences Across the Specimen.

**G.** ASTM E 330 - Standard Test Method for Structural Performance of Exterior Windows, Doors, Skylights and Curtain Walls by Uniform Static Air Pressure Difference.

**H.** ASTM E 331 - Standard Test Method for Water Penetration of Exterior Windows, Skylights, Doors, and Curtain Walls by Uniform Static Air Pressure Difference.

##### **1.4 STOREFRONT SYSTEM**

**A.** Performance: Provide aluminum storefront systems that comply with performance requirements indicated, as demonstrated by testing manufacturer's assemblies in accordance with test method indicated.

**1.** Wind Loads: Completed storefront system shall withstand positive and negative wind and service pressure loads normal to wall plane.

**2.** Thermal Movement: Provide for thermal movement caused by 180 degrees F. (82.2 degrees C.) surface temperature, without causing buckling stresses on glass, joint seal

failure, undue stress on structural elements, damaging loads on fasteners, reduction of performance, or detrimental effects.

**3. Deflection:** Maximum allowable deflection in any member when tested in accordance with ASTM E 330-90 with allowable stress in accordance with AA Specifications for Aluminum Structures.

- a. Without Horizontals:  $L/175$  or  $3/4$  inch (19.1mm) maximum. .
- b. With Horizontals:  $L/175$  or  $L/240 + 1/4$  inch (6.4mm) for spans greater than 13 feet-6 inches (4.1m) but less than 40 feet-0 inch (12.2m).

**4. Air Infiltration:** When tested in accordance with ASTM E 283-91 at differential static pressure of 6.24 PSF (299 Pa), completed storefront systems shall have maximum allowable infiltration of 0.03 CFM/FT<sup>2</sup> (0.56 m<sup>3</sup>/h\*m<sup>2</sup>).

**5. Air Infiltration:** When tested in accordance with ASTM E 283-91 at differential static pressure of 6.24 PSF (299 Pa), completed storefront systems shall have maximum allowable infiltration of 0.02 CFM/FT<sup>2</sup> (0.37 m<sup>3</sup>/h\*m<sup>2</sup>).

**6. Air Infiltration:** When tested in accordance with ASTM E 283-91 at differential static pressure of 6.24 PSF (299 Pa), completed storefront systems shall have maximum allowable infiltration of 0.01 CFM/FT<sup>2</sup> (0.19 m<sup>3</sup>/h\*m<sup>2</sup>).

**7. Water Infiltration:** No uncontrolled water other than condensation on indoor face of any component when tested in accordance with ASTM E 331-93 at test pressure differential of 10 PSF (479 Pa).

**8. Water Infiltration:** No uncontrolled water other than condensation on indoor face of any component when tested in accordance with ASTM E 331-93 at test pressure differential of 12 PSF (718 Pa).

**9. Water Infiltration:** No uncontrolled water other than condensation on indoor face of any component when tested in accordance with ASTM E 331-93 at test pressure differential of 15 PSF (718 Pa).

**10. Water Infiltration:** No uncontrolled water other than condensation on indoor face of any component when tested in accordance with ASTM E 331-93 at test pressure differential of 25 PSF (1197 Pa).

**11. Thermal Performance:** When tested in accordance with AAMA 1503.1-88 and ASTM C 236-89:

- a. Condensation Resistance Factor (CRF): A minimum of 60.
- b. Thermal Transmittance U Value: 0.46 BTU/HR/FT<sup>2</sup>/ degrees F or less (frame only).

- c. Condensation Resistance Factor (CRF): A minimum of 61.
- d. Thermal Transmittance U Value: 0.42 BTU/HR/FT<sup>2</sup>/ degrees F or less (frame only).
- e. Condensation Resistance Factor (CRF): A minimum of 63.
- f. Thermal Transmittance U Value: 0.46 BTU/HR/FT<sup>2</sup>/ degrees F or less (frame only).

**B. Provide aluminum storefront systems that comply with South Florida Building Code Protocol PA 202-94.**

- 1. Air Infiltration: Completed storefront systems shall have 0.01 CFM/FT<sup>2</sup> (0.18 m<sup>3</sup>/h\*m<sup>2</sup>) maximum allowable infiltration when tested in accordance with ASTM E 283-91 at differential static pressure of 6.24 psf (299 Pa).
- 2. Water Infiltration: No uncontrolled water other than condensation on indoor face of any component when tested in accordance with ASTM E 331-93 at test pressure differential of 10 psf (479 Pa). Water test to be performed immediately after design pressure test.
- 3. Wind Loads: Completed storefront system shall withstand wind pressure loads normal to wall plane indicated:
  - a. Exterior Walls:
    - 1) Positive Pressure: 65 psf (3.1kPa).
    - 2) Negative Pressure: 65 psf (3.1kPa).
- 4. Deflection: Maximum allowable deflection in any member when tested in accordance with ASTM E 330-90 with allowable stress in accordance with AA Specifications for Aluminum Structures.
  - a. Without Horizontals: L/175 or 3/4 inch (19.1mm) maximum. .
  - b. With Horizontals: L/175 or L/240 + 1/4 inch (6.4mm) for spans greater than 13 feet-6 inches (4.1m) but less than 40 feet-0 inch (12.2m).
- 5. Thermal Movement: Provide for thermal movement caused by 180 degrees F. (82.2 degrees C.) surface temperature, without causing buckling stresses on glass, joint seal failure, undue stress on structural elements, damaging loads on fasteners, reduction of performance, or detrimental effects.

**C. Provide aluminum storefront systems that comply with South Florida Building Code Protocol PA 201-94, PA 202-94 and PA 203-94.**

- 1. Air Infiltration: Completed storefront systems shall have 0.02 CFM/FT<sup>2</sup> (0.37 m<sup>3</sup>/h\*m<sup>2</sup>) maximum allowable infiltration when tested in accordance with ASTM E

283-91 at differential static pressure of 6.24 psf (299 Pa).

**2. Air Infiltration:** Completed storefront systems shall have 0.04 CFM/FT<sup>2</sup> (0.74 m<sup>3</sup>/h\*m<sup>2</sup>) maximum allowable infiltration when tested in accordance with ASTM E 283-91 at differential static pressure of 6.24 psf (299 Pa).

**3. Water Infiltration:** No uncontrolled water other than condensation on indoor face of any component when tested in accordance with ASTM E 331-93 at test pressure differential of 12 psf (575 Pa). Water test to be performed immediately after design pressure test.

**4. Wind Loads:** Completed storefront system shall withstand wind pressure loads normal to wall plane indicated:

- a. Exterior Walls: with steel reinforcing.
  - 1) Positive Pressure: 70 psf (3.4 kPa).
  - 2) Negative Pressure: 90 psf (4.3 kPa).
- b. Exterior Walls: without steel reinforcing.
  - 1) Positive Pressure: 50 psf (2.4 kPa).
  - 2) Negative Pressure: 70 psf (3.4 kPa).

**5. Deflection:** Maximum allowable deflection in any member when tested in accordance with ASTM E 330-90 with allowable stress in accordance with AA Specifications for Aluminum Structures.

- a. Without Horizontals: L/175 or 3/4 inch (19.1mm) maximum. .
- b. With Horizontals: L/175 or L/240 + 1/4 inch (6.4mm) for spans greater than 13 feet-6 inches (4.1m) but less than 40 feet-0 inch (12.2m).

**6. Thermal Movement:** Provide for thermal movement caused by 180 degrees F. (82.2 degrees C.) surface temperature, without causing buckling stresses on glass, joint seal failure, undue stress on structural elements, damaging loads on fasteners, reduction of performance, or detrimental effects.

## **1.5 ENTRANCE SYSTEM**

**A.** Provide aluminum swing doors that comply with the following performance requirements:

**1. Air Infiltration (Single Acting Butt Hinges or Offset Pivots):** Air infiltration shall be tested in accordance with ASTM E283-91 at static pressure of 1.57 PSF (75 Pa). Infiltration shall not exceed the following:

- a. 20D Single Doors: 0.18 CFM/FT (1.02 m<sup>3</sup>/h\*m) of crack length.
- b. 20D Pair of Doors: 0.27 CFM/FT (1.53 m<sup>3</sup>/h\*m) of crack length.
- c. 40D Single Doors: 0.40 CFM/FT (2.27 m<sup>3</sup>/h\*m) of crack length.
- d. 40D Pair of Doors: 1.22 CFM/FT (6.92 m<sup>3</sup>/h\*m) of crack length.

- e. 35D/50D Single Doors: 0.43 CFM/FT (2.44 m<sup>3</sup>/h\*m) of crack length.
- f. 35D/50D Pair of Doors: 0.50 CFM/FT (2.83 m<sup>3</sup>/h\*m) of crack length.
- 2. Structural: Door corner structural strength test using a dual moment loading criteria:
  - a. Model: 20D Swing Door; 245 lbs (111 kg).
  - b. Model: 35D Swing Door; 290 lbs (132 kg).
  - c. Model: 40D Swing Door; 470 lbs (213 kg).
  - d. Model: 50D Swing Door; 300 lbs (136 kg).
- 3. Structural Uniform Load Test:
  - a. Single Doors: 90 psf (4.3 kPa).
  - b. Pair of Doors: 90 psf (4.3 kPa).
- 4. Structural Uniform Load Test:
  - a. Single Doors: +90/-104 psf (4.3 kPa/-4.98 kPa).
  - b. Pair of Doors: +45/-45 psf (4.3 kPa/-2.2kPa).
- 5. Forced Entry Resistance: 300 lbs (136 kg) satisfactory.

## **1.6 SUBMITTALS**

**A.** Submit under provisions of Section 01300.

**B.** Product Data - Manufacturer's data sheets on each product to be used, including:

- 1. Preparation instructions and recommendations.
- 2. Storage and handling requirements and recommendations.
- 3. Installation methods.

**C.** Shop Drawings:

- 1. Drawings showing layout, profiles, and product components, including anchorage, accessories, finish colors and textures.

**D.** Certifications:

- 1. Submit certified test reports showing compliance with specified performance characteristics and physical properties.

**E.** Selection Samples: For each finish product specified, two complete sets of color chips representing manufacturer's full range of available colors and patterns.

**F.** Verification Samples: For each finish product specified, two samples, minimum size 6 inches (150 mm) square, representing actual product, color, and patterns.

**G.** Project Record Documents: Submit project record documents for installed materials in accordance with Section 01700 - Project Closeout (Project Record Documents) Section.

## **1.7 QUALITY ASSURANCE**

**A. Manufacturer Qualifications:**

1. Manufacturer capable of providing field service representation during construction, approving acceptable installer and approving application method.

**B. Installer Qualifications:**

1. Installer experienced to perform work of this section that has specialized in the installation of work similar to that required for this project.
2. Submit reference list of completed projects.

**C. Mock-Up: Provide a mock-up for evaluation of surface preparation techniques and application workmanship.**

1. Install at project site a job mock-up using acceptable products and manufacturer approved installation methods in location designated by Architect.
2. Do not proceed with remaining work until workmanship, color, and sheen are approved by Architect.
3. Refinish mock-up area as required to produce acceptable work.

**1.8 DELIVERY, STORAGE, AND HANDLING**

**A.** Store products in manufacturer's unopened packaging until ready for installation.

**B.** Store and dispose of solvent-based materials, and materials used with solvent-based materials in accordance with requirements of local authorities having jurisdiction.

**1.9 PROJECT CONDITIONS**

**A.** Maintain environmental conditions (temperature, humidity, and ventilation) within limits recommended by manufacturer for optimum results. Do not install products under environmental conditions outside manufacturer's absolute limits.

**1.10 WARRANTY**

**A. Manufacturer's Warranty:** Submit, for Owner's acceptance, manufacturer's standard warranty document executed by authorized company official. Manufacturer's warranty is in addition to, and not a limitation of, other rights Owner may have under the Contract Documents.

1. Beneficiary: Issue warranty in the legal name of the project Owner.
2. Warranty Period: Ten (10) years commencing on Date of Substantial Completion.
3. Warranty Acceptance: Owner is sole authority who will determine acceptability of manufacturer's warranty documents.

**PART 2 PRODUCTS**

## 2.1 MANUFACTURERS

### A. Acceptable Manufacturers:

1. YKK AP America, Inc.
2. Kawneer Co., Inc.
3. EFCO Corporation

### B. Coordinate with requirements of Division 1 section on product options and substitutions.

### C. Substitutions: Or Equal.

### D. Requests for substitutions will be considered in accordance with provisions of Section 01600.

## 2.2 STOREFRONT APPLICATIONS/SCOPE

### A. Center set, flush glazed; jambs continuous; head, sill, and jamb attached by screws into rough opening.

### B. Center set, flush glazed; jambs and vertical mullions continuous; head, sill, intermediate horizontal attached by screw spline joinery. Manufacturer's standard extruded aluminum expansion mullions, 90 degree corner posts, three way corner post, entrance door framing, and indicated shapes.

### C. Center set, flush glazed; head and sill members continuous; intermediate horizontals attached by means of shear block. Jambs and vertical mullions are captured inside the continuous head and sill members and held in place by filler inserts. Manufacturer's standard extruded aluminum expansion mullions, 0 - 15 degree hinged mullions, 90 degree corner posts, entrance door framing, and indicated shapes.

### D. Center rabbet, exterior flush glazed; jambs and vertical mullions continuous; head, sill, intermediate horizontal attached by screw spline joinery. Manufacturer's standard extruded aluminum expansion mullions, 0- 15 degree hinged mullions, 90 degree corner posts, flexible corner posts, three way corner post, 93- 170 degree flexible corner posts, entrance door framing, and indicated shapes.

### E. Center set, exterior flush glazed; jambs and vertical mullions continuous; head, sill, intermediate horizontal attached by screw spline joinery. Manufacturer's standard extruded aluminum mullions, 90 degree corner posts, entrance door framing, and indicated shapes. Provide continuous thermal barrier by means of 6/6 nylon polyamide glass fiber reinforced pressure extruded bars. Systems employing non-structural thermal barriers are not acceptable.

### F. Center set, exterior flush glazed; jambs and vertical mullions continuous; head, sill, intermediate horizontal attached by screw spline joinery or shear block attachment. Manufacturer's standard extruded aluminum mullions, 90 degree corner posts, entrance door framing, and indicated shapes. Provide continuous thermal barrier by means of a poured and debridged pocket consisting of a two-part, chemically curing high density polyurethane which is bonded to the aluminum by YKK ThermaBond Plus. Systems employing non-structural thermal barriers are not acceptable.

**G.** Hurricane resistant. Center rabbet, exterior flush glazed; jambs and vertical mullions continuous; head, sill, intermediate horizontal attached by screw spline joinery. Manufacturer's standard extruded aluminum mullions, entrance doors, framing, and indicated shapes.

**H.** Thermally broken, exterior flush glazed; horizontal and vertical framing members shall have a nominal face dimension of 1-3/4 inches (44.5 mm). Intermediate horizontals attached by screw spline and/or shear block joinery with concealed fasteners. Manufacturer's standard extruded aluminum mullions, entrance door framing, and indicated shapes.

**I.** Impact resistant. Center set, exterior flush glazed; jambs and vertical mullions continuous; head, sill, intermediate horizontal attached by screw spline joinery. Continuous and wept sill flashing. Manufacturer's standard extruded aluminum mullions, entrance doors, framing, and indicated shapes, perimeter anchor fillers and steel reinforcing as required.

1. Glass for Large Missile Impact:

- a. 1/4 inch (6 mm) or 3/8 inch (9.5 mm) glass with DuPont SentryGlas Composite laminate.
- b. 7/16 inch (11 mm) or 9/16 inch (14.3 mm) Saf-Glas by Security Impact Glass. Annealed, heat strengthened, or tempered as required unless otherwise noted.
- c. 9/16 inch (14.3 mm) Solutia Saflex HP (heat strengthened only).
- d. 9/16 inch (14.3 mm) laminated glass with 0.090 inch PVB interlayer (heat strengthened only).

2. Glass for Small Missile Impact:

- a. 9/16 inch (14.3 mm) laminated glass with 0.060 inch (1.5 mm) PVB interlayer (heat strengthened only).

3. Glazing: Manufacturer's standard glazing stops with EPDM glazing gaskets to prevent water infiltration at the exterior and Dow 995 Structural Silicone Adhesive with fixed stops at the interior.

**J.** Impact resistant. Center set, exterior flush glazed; jambs and vertical mullions continuous; head, sill, intermediate horizontal attached by screw spline joinery. Continuous and wept sill flashing. Manufacturer's standard extruded aluminum mullions, entrance doors, framing, and indicated shapes, perimeter anchor fillers and steel reinforcing as required.

1. Glass for Large Missile Impact at 50 psf:

- a. 1-5/16 inches (33 mm) Solutia Saflex with 0.090 inch (2.3 mm) PVB interlayer (heat strengthened only).
- b. 1-5/16 inches (33 mm) laminated glass with 0.090 inch (2.3 mm) Butacite PVB interlayer (heat strengthened only).

2. Glass for Large Missile Impact at 70 psf:

- a. 1 inch (25 mm) glass with DuPont SentryGlas Composite laminate.
- b. 1-5/16 inches (33 mm) Saf-Glas by Security Impact Glass with 0.070 inch (1.8 mm) Polycarbonate interlayer. Annealed, heat strengthened, or tempered as required unless otherwise noted.
- c. 1-5/16 inches (33 mm) Solutia Saflex HP with 0.100 inch (2.5 mm) PVB interlayer (heat strengthened only).
- 3. Glass for Small Missile Impact:
  - a. 1-5/16 inches (33 mm) Solutia Saflex with 0.060 inch (1.5 mm) PVB interlayer (heat strengthened only).
  - b. 1-5/16 inches (33 mm) laminated glass with 0.060 inch (1.5 mm) Butacite PVB interlayer (heat strengthened only).
- 4. Glazing: Dow Corning 995 Structural Silicone Adhesive.

## 2.3 ENTRANCE APPLICATIONS/SCOPE

**A. Standard Entrances:** See Architectural drawings for door pattern.

- 1. Corner Construction: Fabricate door corners joined by concealed reinforcement secured with screws, and sigma deep penetration welding.
- 2. Glazing Stops: Manufacturer's standard snap-in glazing stops with EPDM glazing gaskets to prevent water infiltration.
- 3. Weatherstripping: Manufacturer's standard pile type in replaceable rabbets for stiles; manufacturer's standard EPDM bulb type in door frames.
- 4. Hardware: Manufacturer's standard as selected by Architect.

**B. Hurricane Resistant Doors:**

- 1. Corner Construction: Fabricate door corners joined by concealed reinforcement secured with screws, and sigma deep penetration welding.
- 2. Glazing Stops: Manufacturer's standard snap-in glazing stops with EPDM glazing gaskets to prevent water infiltration.
- 3. Weatherstripping: Manufacturer's standard pile type in replaceable rabbets for stiles; manufacturer's standard EPDM bulb type in door frames.
- 4. Hardware (Per Leaf):
  - a. (1-1/2) pair mortise butt hinges, Ball bearing, 4-1/2 by 4, (H-2301).
  - b. (1) Adams Rite MS1850 three point hook bolt lock.
  - c. (2) H-4202 Keyed cylinders (H-4204 thumb turn on inside optional).
  - d. (1) Set type "A" standard YKK AP push/pull.
  - e. (1) Type "C" 1 inch diameter tubular push/pull.
  - f. (1) E9-0482 mill finish aluminum threshold with E2-0051 elastomer weather strip, wept, and counterflashed.

**C. Impact Resistant Doors:**

- 1. Glass for Large Missile Impact:
  - a. 1/4 inch (6 mm) or 3/8 inch (9.5 mm) glass with DuPont SentryGlas Composite laminate.
  - b. 9/16 inch (14 mm) DuPont SentryGlas Plus.

c. 7/16 inch (11 mm) or 9/16 inch (14 mm) Saf-Glas by Security Impact Glass; Annealed, heat strengthened, or tempered as required.

2. Corner Construction: Fabricate door corners joined by concealed reinforcement secured with screws, and sigma deep penetration welding.

3. Glazing: Manufacturer's standard glazing stops with EPDM glazing gaskets to prevent water infiltration at the exterior and Dow 995 Structural Silicone Adhesive with fixed stops at the interior.

4. Weather-stripping: Manufacturer's standard elastomer type in replaceable rabbets for stiles and rails.

5. Hardware:

a. (1-1/2 to 2) pair of Grade 1 mortise butt hinges per leaf. Ball bearing 4-1/2 by 4 Brass US26D finish.

b. (1) Adams Rite MS1850 three point hook bolt lock on active leaf or single door.

(1) Adams Rite two point lock on inactive leaf.

c. (2) H-4202 Keyed cylinders (H-4204 thumb turn on inside optional).

d. Type "A" standard YKK AP push/pull.

e. Type "C" 1 inch (25 mm) diameter tubular push/pull.

f. LCN 4040 surface mounted closer (hold open optional).

g. (1) E9-0502 mill finish aluminum threshold with E9-0503 adapter and E2-0051 elastomer weather-strip, counterflashed using E9-0616 extruded aluminum flashing. Threshold and flashing are wept to the exterior.

## **1.2 MATERIALS**

**A.** Extrusions: ASTM B 221 (ASTM B 221M), 6063-T5 Aluminum Alloy.

**B.** Aluminum Sheet:

1. Anodized Finish: ASTM B 209 (ASTM B 209M), 5005-H14 Aluminum Alloy, 0.050 inch (1.27 mm) minimum thickness.

2. Painted Finish: ASTM B 209 (ASTM B 209M), 3003-H14 Aluminum Alloy, 0.080 inch (1.95 mm) minimum thickness.

**C.** Accessories:

1. Fasteners: Zinc plated steel concealed fasteners; Hardened aluminum alloys or AISI 300 series stainless steel exposed fasteners, countersunk, finish to match aluminum color.

2. Sealant: Non-skinning type, AAMA 803.3.

3. Glazing: Setting blocks, edge blocks, and spacers in accordance with ASTM C 864, shore durometer hardness as recommended by manufacturer; Glazing gaskets in accordance with ASTM C 864.

## **1.3 FABRICATION**

**A.** Frame Construction:

1. Fabricate and assemble units with joints only at intersection of aluminum members

with uniform hairline joints; rigidly secure, and sealed in accordance with manufacturer's recommendations.

2. Hardware: Drill and cut to template for hardware. Reinforce frames and door stiles to receive hardware in accordance with manufacturer's recommendations.

3. Welding: Conceal welds on aluminum members in accordance with AWS recommendations or methods recommended by manufacturer. Members showing welding bloom or discoloration on finish or material distortion will be rejected.

**B. Door Construction:**

1. Corner Construction: Fabricate door corners joined by concealed reinforcement secured with screws, and sigma deep penetration welding.

2. Glazing Stops: Manufacturer's standard snap-in glazing stops with EPDM glazing gaskets to prevent water infiltration.

3. Weatherstripping: Manufacturer's standard pile type in replaceable rabbets for stiles; manufacturer's standard EPDM bulb type in door frames.

4. Hardware: Manufacturer's standard as selected by Architect.

**C. Fabrication Tolerances:**

1. Material Cuts: Square to 1/32 inch (0.8 mm) off square, maximum, over largest dimension; proportionate amount of

2. 1/32 inch (0.8 mm) on other two dimensions.

3. Maximum Offset: 1/64 inch (0.4 mm) in alignment between two consecutive members in line, end to end.

4. Maximum Offset: 1/64 inch (0.4 mm) between framing members at glazing pocket corners.

5. Joints (Between adjacent members in same assembly): Hairline and square to adjacent member.

6. Variation (In squaring diagonals for doors and fabricated assemblies): 1/16 inch (1.6 mm).

7. Flatness (For doors and fabricated assemblies): +/- 1/16 inch (+/- 1.6 mm) off neutral plane.

## **1.4 FINISH**

A. Anodized Finishing: Prepare aluminum surfaces for specified finish; apply shop finish in accordance with the following:

1. Anodic Coating: Electrolytic color coating followed by an organic seal applied in accordance with the requirements of AAMA 612-02. Aluminum extrusions shall be produced from quality controlled billets meeting AA-6063-T5.

a. Exposed Surfaces shall be free of scratches and other serious blemishes.

b. Extrusions shall be given a caustic etch followed by an anodic oxide treatment and then sealed with an organic coating applied with an electrodepositing process.

c. The anodized coating shall comply with the requirements of AAMA 612-02: Voluntary Specifications, Performance Requirements and Test Procedures for Combined Coatings of Anodic Oxide and Transparent Organic Coatings on Architectural Aluminum. Testing shall demonstrate the ability of the finish to resist damage from mortar, salt spray, and chemicals commonly found on construction sites, and to resist the loss of color and gloss.

d. Overall coating thickness for finishes shall be a minimum of 0.7 mils (.018 mm).

2. CASS Corrosion Resistance Test, CASS 240/ASTM B368 Test Method.

3. AAMA 2605 Performance Tests:

- a. 7.3 Dry Film Hardness.
- b. 7.8.2 Salt Spray Resistance.
- c. 7.9.1.2 Color Retention, South Florida.
- d. 7.9.1.4 Gloss Retention, South Florida.

**B. High Performance Organic Coating Finish:**

- 1. Type Factory applied two-coat 70 percent Kynar resin by Auto Chem or 70 percent Hylar resin by Ausimont, fluoropolymer based coating system, Polyvinylidene Fluoride (PVF-2), applied in accordance with YKK AP procedures and meeting AAMA 2605 specifications.
- 2. Colors: Selected by Architect from the following:
  - a. Standard coating color charts.
  - b. Custom coating color charts.
  - c. Color Name and Number:

**C. Finishes Testing:**

- 1. Apply 0.5 percent solution NaOH, sodium hydroxide, to small area of finished sample area; leave in place for sixty minutes; lightly wipe off NaOH; Do not clean area further.
- 2. Submit samples with test area noted on each sample.

## **PART 2 EXECUTION**

### **2.1 EXAMINATION**

- A.** Do not begin installation until openings have been properly prepared.
- B.** If opening preparation is the responsibility of another installer, notify Architect of unsatisfactory conditions before proceeding.
- C.** Verify actual measurements/openings by field measurements before fabrication; show recorded measurements on shop drawings. Coordinate field measurements, fabrication schedule with construction progress to avoid construction delays.

### **2.2 INSTALLATION**

- A.** Install in accordance with manufacturer's instructions.
- B.** Install manufacturer's system in accordance with shop drawings, and within specified tolerances.
  - 1. Protect aluminum members in contact with masonry, steel, concrete, or dissimilar materials using nylon pads or bituminous coating.
  - 2. Shim and brace aluminum system before anchoring to structure.
  - 3. Seal metal to metal sash joints using sealant recommended by system manufacturer.
  - 4. Verify storefront system allows water entering system to be collected in gutters and wept to exterior.

5. Locate expansion mullions where indicated on reviewed shop drawings.

**C. Manufacturer's Field Services:** Provide manufacturer's field service consisting of product use recommendations and periodic site visit for inspection of product installation in accordance with manufacturer's instructions.

## **2.3 TESTING**

**A. Field Test:** Conduct field test to determine water tightness of storefront and entrance system. Conduct test in accordance with AAMA 501.3-94 at locations selected by Architect.

## **2.4 PROTECTION**

**A.** Adjust swing doors for operation in accordance with manufacturer's recommendations.

**B.** Clean installed products in accordance with manufacturer's instructions prior to owner's acceptance, and remove construction debris from project site. Legally dispose of debris.

**C.** Protect the installed product's finish surfaces from damage during construction.

**D.** Touch-up, repair or replace damaged products before Substantial Completion.

## **END OF SECTION**

**SECTION 087100****DOOR HARDWARE****PART 1 - GENERAL****1.1 SUMMARY:**

- A. Section Includes: Finish Hardware for door openings, except as otherwise specified herein.
  - 1. Door hardware for aluminum doors.
  - 2. Keyed cylinders as indicated.
- B. Related Sections:
  - 1. Division 6: Rough Carpentry.
  - 2. Division 8: Aluminum Doors and Frames
  - 3. Division 26 Electrical
  - 4. Division 28: Electronic Security
- C. References: Comply with applicable requirements of the following standards. Where these standards conflict with other specific requirements, the most restrictive shall govern.
  - 1. Builders Hardware Manufacturing Association (BHMA)
  - 2. NFPA 101 Life Safety Code
  - 3. NFPA 80 -Fire Doors and Windows
  - 4. ANSI-A156.xx- Various Performance Standards for Finish Hardware
  - 5. UL10C – Positive Pressure Fire Test of Door Assemblies
  - 6. ANSI-A117.1 – Accessible and Usable Buildings and Facilities
  - 7. DHI /ANSI A115.IG – Installation Guide for Doors and Hardware
- D. Intent of Hardware Groups
  - 1. Should items of hardware not definitely specified be required for completion of the Work, furnish such items of type and quality comparable to adjacent hardware and appropriate for service required.
  - 2. Where items of hardware aren't definitely or correctly specified, are required for completion of the Work, a written statement of such omission, error, or other discrepancy to Architect, prior to date specified for receipt of bids for clarification by addendum; or, furnish such items in the type and quality established by this specification, and appropriate to the service intended.
- E. Allowances
  - 1. Refer to Division 1 for allowance amount and procedures.
- F. Alternates
  - 1. Refer to Division 1 for Alternates and procedures.

**1.2 SUBSTITUTIONS:**

- A. Comply with Division 1.

**1.3 SUBMITTALS:**

- A. Comply with Division 1.
- B. Special Submittal Requirements: Coordinate submittals of this Section with related Sections to ensure the "design intent" of the system/assembly is understood and can be reviewed together.
- C. Product Data: Manufacturer's specifications and technical data including the following:
  - 1. Detailed specification of construction and fabrication.
  - 2. Manufacturer's installation instructions.
  - 3. Wiring diagrams for each electric product specified. Coordinate voltage with electrical before submitting.
  - 4. Submit 6 copies of catalog cuts with hardware schedule.
- D. Shop Drawings - Hardware Schedule: Submit 6 complete reproducible copy of detailed hardware schedule in a vertical format.
  - 1. List groups and suffixes in proper sequence.
  - 2. Completely describe door and list architectural door number.
  - 3. Manufacturer, product name, and catalog number.
  - 4. Function, type, and style.
  - 5. Size and finish of each item.
  - 6. Mounting heights.
  - 7. Explanation of abbreviations and symbols used within schedule.
  - 8. Detailed wiring diagrams, specially developed for each opening, indicating all electric hardware, security equipment and access control equipment, and door and frame rough-ins required for specific opening.
- E. Templates: Submit templates and "reviewed Hardware Schedule" to door and frame supplier and others as applicable to enable proper and accurate sizing and locations of cutouts and reinforcing.
  - 1. Templates, wiring diagrams and "reviewed Hardware Schedule" of electrical terms to electrical for coordination and verification of voltages and locations.
- F. Samples: (If requested by the Architect)
  - 1. 1 sample of Lever and Rose/Escutcheon design, (pair).
  - 2. 3 samples of metal finishes
- G. Contract Closeout Submittals: Comply with Division 1 including specific requirements indicated.
  - 1. Operating and maintenance manuals: Submit 3 sets containing the following.
    - a. Complete information in care, maintenance, and adjustment, and data on repair and replacement parts, and information on preservation of finishes.
    - b. Catalog pages for each product.
    - c. Name, address, and phone number of local representative for each manufacturer.
    - d. Parts list for each product.

2. Copy of final hardware schedule, edited to reflect, "As installed".
3. Copy of final keying schedule
4. As installed "Wiring Diagrams" for each piece of hardware connected to power, both low voltage and 110 volts.
5. One set of special tools required for maintenance and adjustment of hardware, including changing of cylinders.

#### 1.4 QUALITY ASSURANCE

##### A. Comply with Division 1.

1. Statement of qualification for distributor and installers.
2. Statement of compliance with regulatory requirements and single source responsibility.
3. Distributor's Qualifications: Firm with 3 years experience in the distribution of commercial hardware.
  - a. Distributor to employ full time Architectural Hardware Consultants (AHC) for the purpose of scheduling and coordinating hardware and establishing keying schedule.
  - b. Hardware Schedule shall be prepared and signed by an AHC.
4. Installer's Qualifications: Firm with 3 years experienced in installation of similar hardware to that required for this Project, including specific requirements indicated.
5. Regulatory Label Requirements: Provide testing agency label or stamp on hardware for labeled openings.
  - a. Provide UL listed hardware for labeled and 20 minute openings in conformance with requirements for class of opening scheduled.
  - b. Underwriters Laboratories requirements have precedence over this specification where conflict exists.
6. Single Source Responsibility: Except where specified in hardware schedule, furnish products of only one manufacturer for each type of hardware.

- B. Review Project for extent of finish hardware required to complete the Work. Where there is a conflict between these Specifications and the existing hardware, notify the Architect in writing and furnish hardware in compliance with the Specification unless otherwise directed in writing by the Architect.

#### 1.5 DELIVERY, STORAGE, AND HANDLING

##### A. Packing and Shipping: Comply with Division 1.

1. Deliver products in original unopened packaging with legible manufacturer's identification.
2. Package hardware to prevent damage during transit and storage.
3. Mark hardware to correspond with "reviewed hardware schedule".
4. Deliver hardware to door and frame manufacturer upon request.

- B. Storage and Protection: Comply with manufacturer's recommendations.

#### 1.6 PROJECT CONDITIONS:

- A. Coordinate hardware with other work. Furnish hardware items of proper design for use on doors and frames of the thickness, profile, swing, security and similar requirements indicated, as

necessary for the proper installation and function, regardless of omissions or conflicts in the information on the Contract Documents.

- B. Review Shop Drawings for doors and entrances to confirm that adequate provisions will be made for the proper installation of hardware.

#### 1.7 WARRANTY:

- A. Refer to Conditions of the Contract
- B. Manufacturer's Warranty:
  - 1. Closers: Ten years
  - 2. Exit Devices: Three Years
  - 3. Locksets & Cylinders: Three years
  - 4. All other Hardware: Two years.

#### 1.8 OWNER'S INSTRUCTION:

- A. Instruct Owner's personnel in operation and maintenance of hardware units.

#### 1.9 MAINTENANCE:

- A. Extra Service Materials: Deliver to Owner extra materials from same production run as products installed. Package products with protective covering and identify with descriptive labels. Comply with Division 1 Closeout Submittals Section.
  - 1. Special Tools: Provide special wrenches and tools applicable to each different or special hardware component.
  - 2. Maintenance Tools: Provide maintenance tools and accessories supplied by hardware component manufacturer.
  - 3. Delivery, Storage and Protection: Comply with Owner's requirements for delivery, storage and protection of extra service materials.
- B. Maintenance Service: Submit for Owner's consideration maintenance service agreement for electronic products installed.

### PART 2 - PRODUCTS

#### 2.1 MANUFACTURERS:

- A. The following manufacturers are approved subject to compliance with requirements of the Contract Documents. Approval of manufacturers other than those listed shall be in accordance with Division 1. Materials specified are for bid purposes. Field verification of existing conditions is required. Match hardware to the previous construction as closely as possible. New locks and latches are to be the same design and finish. Contractor and supplier are to coordinate these requirements in consultation with the Architect and owner.

<u>Item:</u>	<u>Manufacturer:</u>	<u>Approved:</u>
Hinges	Stanley	
Locksets	Sargent	
Cylinders	Mul T Lock	
Exit Devices	Sargent	
Closers	Stanley D-4550	K2
Push/Pull Plates	Rockwood	

Push/Pull Bars	Rockwood
Protection Plates	Rockwood
Door Stops	Rockwood
Flush Bolts	Rockwood
Coordinator & Brackets	Rockwood
Threshold & Gasketing	National Guard

## 2.2 MATERIALS:

### A. Hinges: Shall be Five Knuckle Ball bearing hinges

1. Template screw hole locations
2. Bearings are to be fully hardened.
3. Bearing shell is to be consistent shape with barrel.
4. Minimum of 2 permanently lubricated non-detachable bearings on standard weight hinge and 4 permanently lubricated bearing on heavy weight hinges.
5. Equip with easily seated, non-rising pins.
6. Non Removable Pin screws shall be slotted stainless steel screws.
7. Hinges shall be full polished, front, back and barrel.
8. Hinge pin is to be fully plated.
9. Bearing assembly is to be installed after plating.
10. Sufficient size to allow 180-degree swing of door
11. Furnish five knuckles with flush ball bearings
12. Provide hinge type as listed in schedule.
13. Furnish 3 hinges per leaf to 7 foot 6 inch height. Add one for each additional 30 inches in height or fraction thereof.
14. Tested and approved by BHMA for all applicable ANSI Standards for type, size, function and finish
15. UL10C listed for Fire

### B. Cylindrical Type Locks and Latchsets:

1. Tested and approved by BHMA for ANSI A156.2, Series 4000, Operational Grade 2, Standard Duty, and be UL10C listed where required.
2. Fit modified ANSI A115.2 door preparation
3. Each lever to have independent spring mechanism controlling it
4. 2-3/4 inch (70 mm) backset
5. Provide sufficient curved strike lip to protect door trim
6. Provide locksets with 6-pin cylinders
7. Functions and design as indicated in the hardware groups

### C. Mortise Type Locks and Latches:

1. Tested and approved by BHMA for ANSI A156.13, Series 1000, Operational Grade 1, Extra-Heavy Duty, Security Grade 2 and be UL10C
2. Fit ANSI A115.1 door preparation
3. Functions and design as indicated in the hardware groups
4. Solid, one-piece, 3/4-inch (19mm) throw, anti-friction latchbolt made of self-lubricating stainless steel
5. Deadbolt functions shall have 1 inch (25mm) throw bolt made of hardened stainless steel
6. Auxiliary deadlatch to be made of one piece stainless steel, permanently lubricated
7. Provide sufficient curved strike lip to protect door trim
8. Lock shall have self-aligning, thru-bolted trim
9. Spindle to be designed to prevent forced entry from attacking of lever
10. Each lever to have independent spring mechanism controlling it

## D. Cylinders:

1. Provide the necessary cylinder housings, collars, rings & springs as recommended by the manufacturer for proper installation.
2. Provide the proper cylinder cams or tail piece as required to operate all locksets and other keyed hardware items listed in the hardware sets.
3. Coordinate and provide as required for related sections.

## E. Door Closers shall:

1. Tested and approved by BHMA for ANSI 156.4, Grade 1
2. UL10C certified
3. Closer shall have extra-duty arms and knuckles
4. Conform to ANSI 117.1
5. Maximum 2 7/16 inch case projection with non-ferrous cover
6. Separate adjusting valves for closing and latching speed, and backcheck
7. Provide adapter plates, shim spacers and blade stop spacers as required by frame and door conditions
8. Full rack and pinion type closer with 1½" minimum bore
9. Mount closers on non-public side of door, unless otherwise noted in specification
10. Closers shall be non-handed, non-sized and multi-sized.

## F. Door Stops: Provide a dome floor or wall stop for every opening as listed in the hardware sets.

1. Wall stop and floor stop shall be wrought bronze, brass or stainless steel.
2. Provide fastener suitable for wall construction.
3. Coordinate reinforcement of walls where wall stop is specified.
4. Provide dome stops where wall stops are not practical. Provide spacers or carpet riser for floor conditions encountered

## G. Push Pull Bars: Provide ANSI J504, .1" Dia. Pull and push bar model and series as listed in hardware set. Provide proper fasteners for door construction.

## H. Seals: All seals shall be finished to match adjacent frame color. Seals shall be furnished as listed in schedule. Material shall be UL listed for labeled openings.

## I. Weatherstripping: Provide at head and jambs only those units where resilient or flexible seal strip is easily replaceable. Where bar-type weatherstrip is used with parallel arm mounted closers install weatherstrip first.

1. Weatherstrip shall be resilient seal of (Neoprene, Polyurethane, Vinyl, Pile, Nylon Brush, Silicone)
2. UL10C Positive Pressure rated seal set when required.

## J. Door Bottoms/Sweeps: Surface mounted or concealed door bottom where listed in the hardware sets.

1. Door seal shall be resilient seal of (Neoprene, Polyurethane, Nylon Brush, Silicone)
2. UL10C Positive Pressure rated seal set when required.

## K. Thresholds: Thresholds shall be aluminum beveled type with maximum height of ½" for conformance with ADA requirements. Furnish as specified and per details. Provide fasteners and screws suitable for floor conditions.

## L. Key Control: Provide one wall mounted Telkee RWC-50-S key cabinet complete with hooks, index and tags.

- M. Silencers: Furnish silencers on all interior frames, 3 for single doors, 2 for pairs. Omit where any type of seals occur.

## 2.3 FINISH:

- A. Designations used in Schedule of Finish Hardware - 3.5, and elsewhere to indicate hardware finishes are those listed in ANSI/BHMA A156.18 including coordination with traditional U.S. finishes shown by certain manufacturers for their products
- B. Powder coat door closers to match other hardware, unless otherwise noted.
- C. Aluminum items shall be finished to match predominant adjacent material. Seals to coordinate with frame color.

## 2.4 KEYS AND KEYING:

- A. Provide keyed temporary cylinders and keys during the construction period. Construction keys and cylinders shall not be part of the Owner's permanent keying system. Permanent cylinders and keys (prepared according to the accepted keying schedule) will be furnished to the Owner.
- B. Cylinders, Mul T Lock 248S Series – Coordinate with owner
- C. Permanent keys: Stamped with the applicable key mark for identification. These visual key control marks or codes will not include the actual key cuts.
- D. Transmit Grand Masterkeys, Masterkeys and other Security keys to Owner by Registered Mail, return receipt requested.
- E. Furnish keys in the following quantities:
  - 1. 1 each Grand Masterkeys
  - 2. 4 each Masterkeys
  - 3. 2 each Change keys each keyed core
  - 4. 5 each Construction Keys
- F. The General Contractor, will install permanent cylinders at the agreed upon time with owner requirements, and return the construction cylinders to the Hardware Supplier. Construction cylinders and keys remain the property of the Hardware Supplier.
- G. Keying Schedule: Arrange for a keying meeting, with Architect Owner and hardware supplier, and other involved parties to ensure locksets and locking hardware, are functionally correct and keying complies with project requirements. Furnish 3 typed copies of keying schedule to Architect.

## PART 3 - EXECUTION

### 3.1 EXAMINATION

- A. Verification of conditions: Examine doors, frames, related items and conditions under which Work is to be performed and identify conditions detrimental to proper and or timely completion.
  - 1. Do not proceed until unsatisfactory conditions have been corrected.

### 3.2 INSTALLATION:

- A. Install each hardware item per manufacturer's instructions and recommendations. Do not install surface mounted items until finishes have been completed on the substrate. Set units level, plumb and true to line and location. Adjust and reinforce the attachment substrate as necessary for proper installation and operation.
- B. Conform to local governing agency security ordinance.
- C. Install Conforming to ICC/ANSI A117.1 Accessible and Usable Building and Facilities.
  - 1. Adjust door closer sweep periods so that from the open position of 70 degrees, the door will take at least 3 seconds to move to a point 3 inches from the latch, measured to the landing side of the door.
- D. Installed hardware using the manufacturers fasteners provided. Drill and tap all screw holes located in metallic materials. Do not use "Riv-Nuts" or similar products.

### 3.3 FIELD QUALITY CONTROL AND FINAL ADJUSTMENT

- A. Contractor/Installers, Field Services: After installation is complete, contractor shall inspect the completed door openings on site to verify installation of hardware is complete and properly adjusted, in accordance with both the Contract Documents and final shop drawings.
  - 1. Check and adjust closers to ensure proper operation.
  - 2. Check latchset, lockset, and exit devices are properly installed and adjusted to ensure proper operation.
    - a. Verify levers are free from binding.
    - b. Ensure latchbolts and dead bolts are engaged into strike and hardware is functioning.
  - 3. Report findings, in writing, to architect indicating that all hardware is installed and functioning properly. Include recommendations outlining corrective actions for improperly functioning hardware if required.

### 3.4 SCHEDULE OF FINISH HARDWARE:

#### Manufacturer List

<u>Code</u>	<u>Name</u>
AB	ABH Manufacturing
BY	By Others
CO	Coburn (Leatherneck Hdwe)
MA	Markar
ML	Mul T Lock
NA	National Guard
PR	Precision
RO	Rockwood
SA	Sargent
ST	Stanley

#### Finish List

<b><u>Code</u></b>	<b><u>Description</u></b>
AL	Aluminum
FF	Factory Finish
600	Primed for Painting
625	Satin Chromium Polished
629	Satin Stainless Polished
689	Aluminum Painted
GREY	Grey
US26	Chromium Plated, Polished
US32	Stainless Steel, Polished

**Option List**

<b><u>Code</u></b>	<b><u>Description</u></b>
CD	CYLINDER DOGGING
4BE	BEVELLED 4 SIDES (12" & UNDER)
CSK	COUNTERSUNK HOLES (12" & UNDER)
NRP	NON REMOVEABLE PIN HINGE

**SECTION 08800****GLAZING****PREFACE**

The general provisions of the Contract, including the conditions of the Contract (General, Supplementary and other Conditions) and Division 1, as appropriate, apply to the Work specified in this section.

**1.0 SCOPE****1.1 SUMMARY**

- A. This Section includes glazing for the following products, including those specified in other Sections where requirements are specified by reference to this Section:
  - 1. Window units.
  - 2. Entrances and other doors.

**1.2 DEFINITIONS**

- A. Manufacturer is used in this Section to refer to a firm that produces primary glass or fabricated glass as defined in the referenced glazing standard

**1.3 SYSTEM PERFORMANCE REQUIREMENTS**

- A. General: Provide glazing systems that are produced, fabricated, and installed to withstand normal thermal movement, wind loading, and impact loading (where applicable), without failure including loss or glass breakage attributable to the following: defective manufacture, fabrication, and installation; failure of sealants or gaskets to remain watertight and airtight; deterioration of glazing materials; and other defects in construction.
- B. Glass Design: Glass thickness indicated on Drawings is for detailing only. Conform glass thickness by analyzing Project loads and in-service conditions. Provide glass lites for the various size openings in the thickness and strengths (annealed or heat-treated) to meet or exceed the following criteria.

1. Provide thickness indicated or, if not otherwise indicated, as recommended by glass manufacturer for application indicated.
- C. Normal thermal movement results from the following maximum change range in ambient and surface temperatures acting on glass framing members and glazing components. Base engineering calculation on materials' actual surface temperatures due to both solar heat gain and nighttime sky heat loss.
  1. Temperature Change (Range): 120 deg F (67 deg C), ambient; 180 deg F (100 deg C), material surfaces.

#### 1.4 SUBMITTALS

- A. General: Submit the following according to Conditions of Contract and Division 1 Specification Sections.
- B. Product Data for each glass product and glazing material indicated.
- C. Product certificates signed by glazing materials manufacturers certifying that their products comply with specified requirements.
  1. Separate certifications are not required for glazing materials bearing manufacturer's permanent labels designating type and thickness of glass, provided labels represent a quality control program of a recognized certification agency or independent testing agency acceptable to authorities having jurisdiction.
- D. Compatibility and adhesion test reports from sealant manufacturer indicating that glazing materials were tested for compatibility and adhesion with glazing sealants. Include sealant manufacturer's interpretation of test results relative to sealant performance and recommendations for primers and substrate preparation needed for adhesion.
- E. Product test reports for each type of glazing sealant and gasket indicated, evidencing compliance with requirements specified.
- F. Maintenance data for glass and other glazing materials to include in Operating and Maintenance Manual specified in Division 1.

#### 1.5 QUALITY ASSURANCE

- A. Glazing Publications: Comply with published recommendations of glass product manufacturers and organizations below, except where more stringent requirements are indicated. Refer to the publication for glazing terms not otherwise defined in this Section or in referenced standards.

1. FGMA Publications: "FGMA Glazing Manual" and "Sealant Manual."
- B. Safety Glass: Where safety glass is indicated or required by authorities having jurisdiction, provide type of products complying with ANSI Z97.1 and testing requirements of 16 CFR Part 1201 for Category II materials.
- C. Glazier Qualifications: Engage an experienced glazier who has completed glazing similar in material, design, and extent to that indicated for Project with a record of successful in service performance.
- D. Single Source Responsibility for Glass: Obtain glass from one source for each product indicated below:
  1. Primary glass of each (ASTM C 1036) type and class indicated.
  2. Heat-treated glass of each (ASTM C 1048) condition indicated.
- E. Single Source Responsibility for Glazing Accessories: Obtain glazing accessories from one source for each product and installation method indicated.
- F. Testing is not required when glazing sealant manufacturer can submit required preparation data that is acceptable to Architect and is based on previous testing of current sealant products for adhesion to and compatibility with submitted glazing materials.

#### 1.6 DELIVERY, STORAGE, AND HANDLING

- A. Protect glazing materials to comply with manufacturer's directions and as needed to prevent damage to glass and glazing materials from condensation, temperature changes, direct exposure to sun, or other causes.
  1. Where insulating glass units will be exposed to substantial altitude changes, comply with insulating glass fabricator's recommendations for venting and sealing to avoid hermetic seal ruptures.

#### 1.7 PROJECT CONDITIONS

- A. Environmental Conditions: Do not proceed with glazing when ambient and substrate temperature conditions are outside the limits permitted by glazing materials manufacturer or when glazing channel substrates are wet from rain, frost, condensation, or other causes.

1. Install liquid sealants at ambient and substrate temperatures above 40 deg F (4.4 deg C).

## 2.0 PRODUCTS

### 2.1 MANUFACTURERS

- A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products which may be incorporated in the work included; but are not limited to, the following:

1. Prime Glass Manufacturers

AFG Industries, Inc.  
Ford Glass Division  
Guardian Industries Corp.  
LOF Glass, Inc.  
PPG Industries, Inc.  
Saint-Gobain/ Euroglass

### 2.2 PRIMARY GLASS PRODUCTS

All exterior glass in storefronts, doors and windows to be insulated, low E.  
Tempered glass where indicated on schedule and as mandated by the  
Uniform Building Code .  
Contractor to provide a sample for architect's approval.

### 2.3 HEAT TREATED FLOAT GLASS

- A. Uncoated, Clear, Heat Treated Float Glass: ASTM C 1048, Condition A (uncoated surfaces), Type I (transparent glass flat), Class 1 (clear), Quality q3 (glazing select), kind as indicated below.

1. Kind FT (fully tempered) where indicated.

- B. Uncoated, Tinted, Heat Treated Float Glass: ASTM C 1048, Condition A (uncoated surfaces), Type I (transparent glass flat) Class 2 (tinted heat absorbing and light reducing), Quality q3 (glazing select), with grey color; king as indicated below.

1. Kind FT (fully tempered) where indicated.

- C. Available Manufacturers: Subject to compliance with requirement, manufacturers offering heat treated glass products that may be incorporated in the Work include, but are not limited to, the following companies.

AFG Industries, Inc.

Artistic Glass Products Co.  
Cardinal IG  
Saint-Gobain  
Falconer Glass Industries  
Glasstemp, Inc.  
Guardian Industries Corp.  
HGP Industries  
PPG Industries, Inc.  
Spectrum Glass Products, Inc.  
Tempglass  
Viracon, Inc.

## 2.5 MISCELLANEOUS GLAZING MATERIALS

- A. General: Provide products of material, size, and shape complying with referenced glazing standard, requirements of manufacturers of glass and other glazing materials involved for glazing application indicated, and with a proven record of compatibility with surfaces contacted in installation.
- B. Cleaners, Primers and Sealers: Type recommended by sealant or gasket manufacturer.
- C. Setting Blocks: Elastomeric material with a Shore A durometer hardness of 85 plus or minus 5.
- D. Spacers: Elastomeric blocks or continuous extrusions with a Shore A durometer hardness required by glass manufacturer to maintain glass lites in place for installation indicated.
- E. Edge Blocks: Elastomeric material of hardness needed to limit glass lateral movement (side-walking).
- F. Plastic Foam Joint Fillers: Preformed, compressible, resilient, nonstaining, nonextruding, nonoutgassing, strips of closed-cell plastic foam of density, size and shape to control sealant depth and otherwise contribute to produce optimum sealant performance.

## 3.0 EXECUTION

### 3.1 EXAMINATION

- A. Examine glass framing with glazier present, for compliance with the following:
  - 1. Manufacturing and installation tolerances, including those for size, squareness, offsets at corners.

2. Presence and functioning a weep system.
3. Minimum required face or edge clearances.
4. Effective sealing between joints of glass-framing members.

B. Do not proceed with glazing until satisfactory conditions have been corrected.

### 3.2 PREPARATION

A. Clean glazing channels and other framing members receiving glass immediately before glazing. Remove coatings that are not firmly bonded to substrate.

### 3.3 GLAZING GENERAL

A. Comply with combined recommendations of manufacturers of glass, sealants, gaskets, and other glazing materials, except where more stringent requirements are indicated, including those in referenced glazing publications.

B. Glazing channel dimensions as indicated on Drawings provide necessary bite on glass, minimum edge and face clearances, and adequate sealant thickness, with reasonable tolerances. Adjust as required by Project conditions during installation.

C. Protect glass from edge damage during handling and installation as follows:

1. Use rolling block in rotating glass units to prevent damage to glass corners. Do not impact glass with metal framing. Use suction cups to shift glass units within openings; do not raise or drift glass with a pry bar. Rotate glass lites with flares or bevels on bottom horizontal edges so edges are located at top of opening, unless otherwise indicated by manufacturer's label.

2. Remove damaged glass from Project site and legally dispose of off site. Damaged glass is glass with edge damage or other imperfections that, when installed, weaken glass and impair performance and appearance.

D. Apply primers to joint surfaces where required for adhesion of sealants, as determined by pre-construction sealant-substrate testing.

E. Install elastomeric-setting blocks in sill rabbets, sized and located to comply with reference glazing standard, unless otherwise required by glass manufacturer. Set blocks in thin course of compatible sealant suitable for heel bead.

- F. Do not exceed edge pressures stipulated by glass manufacturers for installing glass lites.
- G. Provide spacers for glass sizes larger than 50 united inches (length plus height) as follows:
  - 1. Locate spacers inside, outside, and directly opposite each other. Install correct size and spacing to preserve required face clearances, except where gaskets and glazing tapes are used that have demonstrated ability to maintain required face clearances and comply with system performance requirements.
  - 2. Provide 1/8" inch minimum bite of spacers on glass and use thickness equal to sealant width. With glazing tape, use thickness slightly less than final compressed thickness of tape.
- H. Provide edge blocking to comply with requirements of referenced glazing publications, unless otherwise required by glass manufacturer.
- I. Set glass lites in each series with uniform pattern, draw, bow, and similar characteristics.

#### 3.4 TAPE GLAZING

- A. Position tapes on fixed stops so that when compressed by glass their exposed edges are flush with or protrude slightly above sightline of stops.
- B. Install tapes continuously but not in one continuous length. Do not stretch tapes to make them fit opening.
- C. Where framing joints are vertical, cover these joints by applying tapes to heads and sills first and then to jambs. Where framing joints are horizontal, cover these joints by applying tapes to jambs and then to heads and sills.
- D. Place joints in tapes at corners of opening with adjoining lengths butted together, not lapped. Seal joints in tapes with compatible sealant approved by tape manufacturer.
- E. Do not remove release paper from tape until just before each lite is installed.

#### 3.5 SEALANT GLAZING (WET)

- A. Provide compressible filler rods or equivalent back-up material, as recommended by sealant and glass manufacturers, to prevent sealant from extruding into glass channel weep systems and from adhering to joints back surface as well as to control depth of sealant for optimum performance, unless otherwise indicated.

- B. Force sealants into glazing channels to eliminate voids and to ensure complete wetting or bond of sealant to glass and channel surfaces.
- C. Tool exposed surfaces of sealants to provide a substantial wash away from glass. Install pressurized gaskets to protrude slightly out of channel to eliminate dirt and moisture pockets.
- D. Where wedge-shaped gaskets are driven into one side of channel to pressurize sealant or gasket on opposite side, provide adequate anchorage to ensure that gasket will not "walk" out when installations subjected to movement.
- E. Miter cut wedge shaped gaskets at corners and install gaskets in manner recommended by gasket manufacturer to prevent pull away at corners; seal corner joints and butt joints with sealant recommended by gasket manufacturer.

### 3.6 PROTECTION AND CLEANING

- A. Protect exterior glass from breakage immediately after installation by attaching crossed streamers to framing held away from glass. Do not apply markers to glass surface. Remove nonpermanent labels and clean surfaces.
- B. Protect glass from contact with contaminating substances resulting from construction operations including weld spatter. If, despite such protection, contaminating substances do come into contact with glass, remove them immediately as recommended by glass manufacturer.
- C. Examine glass surfaces adjacent to or below exterior concrete and other masonry surfaces at frequent intervals during construction, but not less than  
  
once a month, for build-up of dirt scum, alkali deposits, or stains, and remove as recommended by glass manufacturer.
- D. Remove and replace glass that is broken, chipped, cracked, abraded, or damaged in any way, including natural causes, accidents and vandalism, during construction period.
- E. Wash glass on both faces in each area of Project not more than 4 days prior to date scheduled for inspections that establish date of Substantial Completion. Wash glass as recommended by glass manufacturer.

### END OF SECTION

## **SECTION 09250**

### **GYPSUM DRYWALL**

#### **PREFACE**

The general provisions of the Contract, including the Conditions of the Contract (General, Supplementary and other Conditions) and Division 1 as appropriate, apply to the Work specified in this Section.

#### **1.0 SCOPE**

- 1.1 This Section includes all work required to complete the Gypsum Drywall indicated on the Drawings and all supplementary items necessary for its proper installation. This work includes:
  - A. Gypsum drywall including screw-type metal support system.
  - B. Drywall finishing (joint tape and compound treatment)
  - C. Metal stud wall framing.
- 1.2 Related Sections:
  - A. Section 06200 - Finish Carpentry.
  - B. Section 09900 - Painting.
- 1.3 References:
  - A. ANSI/ASTM C36 - Gypsum Wallboard
  - B. ANSI/ASTM C475 - Joint Treatment Materials for Gypsum Wallboard Construction.
  - C. ANSI/ASTM C645 - Non-Load (Axial) Bearing Steel Studs, Runners (Track), and Rigid Furring Channels for Screw Application of Gypsum Board.
  - D. ANSI/ASTM C646 - Steel Drill Screws for the Application of Gypsum Sheet Material to Light Gage Steel Studs.
  - E. ANSI/ASTM C754 - Installation of Framing Members to Receive Screw Attached Gypsum Wallboard, or Water Resistant Backing Board.
  - F. ANSI/ASTM E119 - Fire Tests of Building Construction and Materials.
  - G. GA-201 - Gypsum Board for Walls and Ceilings.
  - H. GA-216 - Recommended Specifications for the Application and Finishing of Gypsum Board.
- 1.4 Quality Assurance:
  - A. Fire-Resistance Rating: Where gypsum drywall is indicated on drawings,

provide fire-resistive gypsum drywall. Provide materials and installations which are identical with those of applicable assemblies tested per ASTM

E119 by fire testing laboratories acceptable to authorities having jurisdiction. Conform to applicable code for fire rated assemblies.

- B. Gypsum Board Terminology Standard: GA-505 Association.
- C. Single-Source Responsibility: Obtain gypsum board products from a single manufacturer, or from manufacturers recommended by the prime manufacturer of gypsum boards.
- D. Applicator shall be a company specializing in Gypsum Board systems.

1.5 Delivery, Storage and Handling:

- A. Deliver materials in original packages, containers or bundles bearing brand name and identification of manufacturer or supplier.
- B. Store materials inside under cover and in a manner to keep them dry, protected from weather, direct sunlight, surface contamination, corrosion and damage from construction traffic and other causes. Neatly stack gypsum boards flat to prevent sagging.
- C. Handle gypsum boards to prevent damage to edges, ends or surfaces. Protect metal corner beads and trim from being bent or damaged.
- D. Light gage metal components such as steel studs and runners, furring channels and resilient channels should be given adequate protection in the warehouse and on the job site against rusting caused by moisture.

1.6 Submittals: Provide product data on metal furring, gypsum board, joint tape and other accessory elements of wall board systems.

1.7 Project Conditions:

- A. Comply with requirements of referenced gypsum board application standards and recommendations of gypsum board manufacturer, for environmental conditions before, during and after application of gypsum board.
- B. Ventilate building spaces as required to remove water in excess of that required for drying of joint treatment material immediately after its application. Avoid drafts during dry, hot weather to prevent too rapid drying.

## 2.0 MATERIALS

## 2.1 Acceptable Manufacturers:

- A. Subject to compliance with requirements, manufacturers offering products

which may be incorporated in the work includes, but is not limited to, the following:

1. American Gypsum Co.
2. Georgia-Pacific Corp.
3. Gold Bond Building Products Div., National Gypsum Co.
4. United States Gypsum Co.

## 2.2 Gypsum Board:

- A. Gypsum Wallboard: ANSI/ASTM C36, of types, edge configuration and thickness indicated below; in maximum lengths available to minimize end-to-end butt joints. Refer to Drawings for application.

1. 5/8-inch gypsum wallboard with tapered edges.

- B. Trim Accessories: Provide manufacturer's standard trim accessories of types indicated for drywall work, formed of galvanized steel unless otherwise indicated, with either knurled and perforated or expanded flanges for nailing or stapling, and beaded for concealment of flanges in joint compound. Provide corner beads (WSG # 103), L-type edge trim-beads (USG # 200-13 series), U-type edge trim-beads, and one piece control joint beads.

- C. Joint Treatment Materials: ANSI/ASTM C475; reinforcing tape, joint compound and adhesive type recommended by the manufacturer for the application indicated.

- D. Miscellaneous Materials: Provide auxiliary materials for gypsum drywall work of the type and grade recommended by the manufacturer of the gypsum board.

1. Gypsum Board Screws: Comply with ASTM C646.

- E. Texture Finish Materials:

1. Primer: Of type recommended by manufacturer.
2. Finish: Full Float Finish

- F. Wall Framing and Ceiling: Partitions shall be framed with steel studs. All studs shall be of size as required for partition thickness shown and shall be spaced not more than 16 inches on center at exterior and fire rated assembly walls and 16 inches on center at all other walls if not otherwise noted.

1. Studs shall be positioned plumb in runners and securely attached top and bottom with not less than one screw on each side of stud ends. Studs shall be in continuous lengths. Types shall be as follows and as shown on drawings.
  - a. Metal Studs: 3-5/8 & 6" inches wide, 20 gauge at interior walls unless otherwise indicated.
2. Floor runners shall be accurately aligned and securely fastened to floor with expansion shields or suitable power-activated fasteners. Ceiling runners and floor runners shall be in long lengths with butted joints. Types shall be as follows and as shown on drawings:
  - a. C-Shaped runners: Same gauge as studs
3. Wall Openings: Steel frames shall be securely attached by anchors to the nearest stud each side of opening with wall-board screws or double strands of tie wire. A ceiling runner channel section will be cut 24 inches longer than the rough opening width and shall be installed horizontally over each opening and runner ends shall be bent, nested and attached to adjacent studs with screws.

### 3.0 EXECUTION

#### 3.1 General Gypsum Board Installation Requirements:

- A. Gypsum Board Application and Finishing Standards: ASTM C840 and GA216.
- B. Locate exposed end-butt joints as far from center of wall and ceilings as possible, and stagger not less than 1'-0" in alternate courses of board.
- C. Install exposed gypsum board with face side out. Do not install imperfect, damaged or damp boards. Butt boards together for a light contact at edges and ends with not more than 1/16 inch open space between boards. Do not force into place.
- D. Locate either edge or end joints over supports, except in horizontal applications or where intermediate supports or gypsum board back-blocking is provided behind end joints. Position boards so that like edges abut tapered edges against tapered edges and mill-cut or field-cut ends against mill-cut or field-cut ends. Do not place tapered edges against cut edges or ends. Stagger vertical joints over different studs on opposite sides of partition.
- E. Attach gypsum board to supplementary framing and blocking provided for

additional support at openings and cutouts.

- F. Form control joints and expansion joints with space between edges of boards, prepared to receive trim accessories.
- G. Space fasteners in gypsum boards in accordance with referenced standards and manufacturer's recommendations, except as otherwise indicated.

### 3.2 Methods of Gypsum Drywall Application:

- A. Single-Layer Fastening Methods: Apply gypsum boards to supports as follows:
  - 1. Position all ends and edges of all gypsum panels over framing members, except when joints are at right angles to framing members as in perpendicular application or when end joints are back blocked.
  - 2. When applicable apply gypsum panels first to the ceiling and then to the walls. Extend ceiling board into corners and make firm contact with top plate. To minimize end joints use panels of maximum practical lengths. Fit ends and edges closely, but not forced together. Stagger end joints in successive courses with joints on opposite sides of a partition placed on different studs.
  - 3. Attach panels to framing supports by power driven screws. Space fasteners not less than 3/8-inch from edges and ends of panel and drive as recommended for specified fastening method. Drive fasteners in field of panels first, working toward ends and edges. Hold panel in firm contact with framing while driving fasteners. Drive fastener heads slightly below surface of gypsum panels in a uniform dimple without breaking face paper.
  - 4. Cut ends, edges & scribe or make cutouts within field of panels in a workmanlike manner.
  - 5. Install trim at all internal and external angles formed by the intersection of either panel surfaces or other surfaces. Apply corner bead to all vertical or horizontal external corners in accordance with manufacturer directions.

### 3.3 Installation of Drywall Trim Accessories: Where feasible, use the same fasteners to anchor trim accessory flanges as required to fasten flanges by nailing or stapling in accordance with manufacturer's instructions and recommendations.

- A. Install metal corner beads at external corners of dry wall work.
- B. Install metal edge trim whenever edge of gypsum board would otherwise be

exposed or semi-exposed, and except where plastic trim is indicated. Provide type with face flange to receive joint compound except where semi-finishing type is indicated.

- B. Install L-type trim where work is tightly abutted to other work, and install special kerf-type where other work is kerfed to receive long leg of L-type

trim. Install U-type trim where edge is exposed, revealed, gasketed or sealant-filled (including expansion joints).

- D. Install metal control joint (beaded-type) where indicated.

3.4 Finishing Drywall: Apply treatment at gypsum board joints (both directions), flanges of trim accessories, penetrations, fastener heads, surface defects and elsewhere as required to prepare work for decoration.

- A. Apply joint tape at joints between gypsum boards, except where trim accessories are indicated.
- B. Apply joint compound in three coats (not including prefill of openings in base), and sand between last two coats and after last coat.

3.5 Application of Texture Finish: **FULL FLOAT FINISH**

- A. Surface Preparation and Primer: Prepare and prime dry wall and other surfaces in strict accordance with texture finish manufacturer's instructions. Apply primer to all surfaces to achieve texture finish.
- B. Finish Application: Mix and apply finish to drywall and other surfaces indicated to receive finish in strict accordance with manufacturer's instructions to produce a uniform texture without starved spots or other evidence of thin application, and free of application patterns.
- C. Remove any texture droppings or over spray from door frames, windows and other adjoining work.

3.6 Protection of Work:

- A. Provide final protection and maintain conditions, in a manner suitable to Installer, which ensures gypsum drywall work being done without damage or deterioration at time of substantial completion.

**END OF SECTION**

## **SECTION 09300**

### **TILE**

#### **PREFACE**

The general provisions of the Contract, including the Conditions of the Contract (General, Supplementary and other Conditions) and Division 1 as appropriate, apply to the Work specified in this Section.

#### **1.0 SCOPE**

- 1.1 This Section includes: Floor and wall tile as noted on the plans.

#### **2.0 MATERIALS**

- 2.1 Ceramic tile: 4" x 4" as shown and noted on drawings. Provide linear rope trim cap at Top of 48" wainscot wall.
- 2.2 Grout: Commercial, unsanded Portland Cement type, Upco Hydroment or equal.
- 2.3 Standard tile color and grout selection by architect upon submittal of samples

#### **3.0 EXECUTION**

- 3.1 Ceramic
  - .1 Install ceramic tile as called for in this specification and as directed by the manufacturer.
  - .2 Tile shall be set in Portland Cement mortar.
  - .3 Tile shall be firmly in place with finished surfaces in true planes. Joints shall be straight, uniform in width and solidly filled. Completed work shall be free from hollow sounding areas and loose, cracked or defective tile.
  - .4 Tile work shall be laid out so that no tiles less than one half of full tile shall occur.

**END OF SECTION**

**SECTION 09510****ACOUSTICAL PANEL CEILINGS****PART 1 - GENERAL****1.1 RELATED DOCUMENTS**

Drawings and general conditions of Contract, including General and Supplementary Conditions and Divisions-1 Specification sections apply to work of this section.

**1.2 SUMMARY**

- A. Section Includes:
  - 1. Acoustical ceiling panels.
  - 2. Exposed grid suspension system.
  - 3. Wire hangers, fasteners, main runners, cross tees, and wall angle moldings.
- B. Related Sections:
  - 1. Section 01350, Special Environmental Requirements
  - 2. Section 09250 - Gypsum Board
  - 3. Section 09120 - Suspension System Framing and Furring for Plaster and Gypsum Board Assemblies
  - 4. Division 15 Sections - Mechanical Work
  - 5. Division 16 Sections - Electrical Work
- C. Alternates
  - 1. Prior Approval: Unless otherwise provided for in the Contract documents, proposed product substitutions may be submitted no later than TEN (10) working days prior to the date established for receipt of bids. Acceptability of a proposed substitution is contingent upon the Architect's review of the bid for acceptability and approved products will be set forth by the Addenda. If included in a Bid are substitute products which have not been approved by Addenda, the specified products shall be provided without additional compensation.
  - 2. Submittals which do not provide adequate data for the product evaluation will not be considered. The proposed substitution must meet all requirements of this section, including but not necessarily limited to, the following: Single source materials suppliers (if specified in Section 1.5); Underwriters' Laboratories Classified Acoustical performance; Panel design, size, composition, color, and finish; Suspension system component profiles and sizes; Compliance with the referenced standards.

**1.3 REFERENCES**

- A. American Society for Testing and Materials (ASTM):
  - 1. ASTM A 1008 Standard Specification for Steel, Sheet, Cold Rolled, Carbon, Structural, High-Strength Low-Alloy and High-Strength Low-Alloy with Improved Formability.
  - 2. ASTM A 641 Standard Specification for Zinc-Coated (Galvanized) Carbon Steel Wire.
  - 3. ASTM A 653 Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) by the Hot-Dip Process.
  - 4. ASTM C 423 Sound Absorption and Sound Absorption Coefficients by the Reverberation Room Method.
  - 5. ASTM C 635 Standard Specification for Metal Suspension Systems for Acoustical Tile and Lay-in Panel Ceilings.
  - 6. ASTM C 636 Recommended Practice for Installation of Metal Ceiling Suspension Systems for Acoustical Tile and Lay-in Panels.
  - 7. ASTM E 84 Standard Test Method for Surface Burning Characteristics of Building Materials.
  - 8. ASTM E 1414 Standard Test Method for Airborne Sound Attenuation Between Rooms Sharing a Common Ceiling Plenum.
  - 9. ASTM E 1111 Standard Test Method for Measuring the Interzone Attenuation of Ceilings Systems.

10. ASTM E 1264 Classification for Acoustical Ceiling Products.
  11. ASTM E 1477 Standard Test Method for Luminous Reflectance Factor of Acoustical Materials by Use of Integrating-Sphere Reflectometers.
  12. ASTM D 3273 Standard Test Method for Resistance to Growth of Mold on the Surface of Interior Coatings in an Environmental Chamber.
  13. ASTM E 119 Standard Test Methods for Fire Tests of Building Construction and Material.
- B. ASHRAE Standard 62.1-2004, "Ventilation for Acceptable Indoor Air Quality"

#### **1.4 SUBMITTALS**

- A. Product Data: Submit manufacturer's technical data for each type of acoustical ceiling unit and suspension system required.
- B. Samples: Minimum 6 inch x 6 inch samples of specified acoustical panel; 8 inch long samples of exposed wall molding and suspension system, including main runner and 4 foot cross tees.
- C. Shop Drawings: Layout and details of acoustical ceilings. Show locations of items which are to be coordinated with, or supported by the ceilings.
- D. Certifications: Manufacturer's certifications that products comply with specified requirements, including laboratory reports showing compliance with specified tests and standards. For acoustical performance, each carton of material must carry an approved independent laboratory classification of NRC, CAC, and AC.
- E. If the material supplied by the acoustical subcontractor does not have an Underwriter's Laboratory classification of acoustical performance on every carton, subcontractor shall be required to send material from every production run appearing on the job to an independent or NVLAP approved laboratory for testing, at the architect's or owner's discretion. All products not conforming to manufacturer's current published values must be removed, disposed of and replaced with complying product at the expense of the Contractor performing the work.

#### **1.5 QUALITY ASSURANCE**

- A. Single-Source Responsibility: Provide acoustical panel units and grid components by a single manufacturer.
- B. Fire Performance Characteristics: Identify acoustical ceiling components with appropriate markings of applicable testing and inspecting organization.
  1. Surface Burning Characteristics: As follows, tested per ASTM E 84 and complying with ASTM E 1264 for Class A products.
    - a. Flame Spread: 25 or less
    - b. Smoke Developed: 50 or less
- C. Handle acoustical ceiling units carefully to avoid chipping edges or damaged units in any way.

#### **1.6 DELIVERY, STORAGE, AND HANDLING**

- A. Deliver acoustical ceiling units to project site in original, unopened packages and store them in a fully enclosed space where they will be protected against damage from moisture, direct sunlight, surface contamination, and other causes.
- B. Before installing acoustical ceiling units, permit them to reach room temperature and a stabilized moisture content.
- C. Handle acoustical ceiling units carefully to avoid chipping edges or damaged units in any way.

#### **1.7 PROJECT CONDITIONS**

- A. Space Enclosure:

All ceiling products and suspension systems must be installed and maintained in accordance with Armstrong written installation instructions for that product in effect at the time of installation and best industry practice. Prior to installation, the ceiling product must be kept clean and dry, in an environment that is between 32°F (0°C) and 120°F (49°C) and not subject to Abnormal Conditions. Abnormal conditions include exposure to chemical fumes, vibrations, moisture from conditions such as building leaks or condensation, excessive humidity, or excessive dirt or dust buildup.

HumiGuard Plus Ceilings: Installation of the products shall be carried out where the temperature is between 32°F (0° C) and 120°F (49° C). It is not necessary for the area to be enclosed or for HVAC systems to be functioning. All wet work (plastering, concrete, etc) must be complete and dry. The ceilings must be maintained to avoid excessive dirt or dust buildup that would provide a medium for microbial growth on ceiling panels. Microbial protection does not extend beyond the treated surface as received from the factory, and does not protect other materials that contact the treated surface such as supported insulation materials.

## 1.8 WARRANTY

- A. Acoustical Panel: Submit a written warranty executed by the manufacturer, agreeing to repair or replace acoustical panels that fail within the warranty period. Failures include, but are not limited to:
  - 1. Acoustical Panels: Sagging and warping as a result of defects in materials or factory workmanship.
  - 2. Grid System: Rusting and manufacturer's defects
  - 3. Acoustical Panels with BioBlock Plus or designated as inherently resistive to the growth of micro-organisms installed with Armstrong suspension systems: Visible sag and will resist the growth of mold/mildew and gram positive and gram negative odor and stain causing bacteria.
- B. Warranty Period Humiguard:
  - 1. Acoustical panels: Ten (10) years from date of substantial completion.
  - 2. Grid: Ten (10) years from date of substantial completion.
  - 3. Acoustical panels and grid systems with HumiGuard Plus or HumiGuard Max performance supplied by one source manufacturer is thirty (30) years from date of substantial completion.
- C. The Warranty shall not deprive the Owner of other rights the Owner may have under other provisions of the Contract Documents and will be in addition to and run concurrent with other warranties made by the Contractor under the requirements of the Contract Documents.

## 1.9 MAINTENANCE

- A. Extra Materials: Deliver extra materials to Owner. Furnish extra materials described below that match products installed. Packaged with protective covering for storage and identified with appropriate labels.
  - 1. Acoustical Ceiling Units: Furnish quality of full-size units equal to 5.0 percent of amount installed.
  - 2. Exposed Suspension System Components: Furnish quantity of each exposed suspension component equal to 2.0 percent of amount installed.

## Part 2-PRODUCTS

### 2.1 MANUFACTURERS

#### A. Ceiling Panels:

- 1. Armstrong World Industries, Inc.

### 2.2.0 ACOUSTICAL CEILING UNITS

#### A. Acoustical Panels Type ACT-1:

- 1. Surface Texture: Medium
- 2. Composition: Mineral Fiber
- 3. Color: White
- 4. Size: 24in X 24in X 5/8in
- 5. Edge Profile: Square Lay-In for interface with Prelude ML 15/16" Exposed Tee.
- 6. Noise Reduction Coefficient (NRC): ASTM C 423; Classified with UL label on product carton, 0.50.

7. Ceiling Attenuation Class (CAC): ASTM C 1414; Classified with UL label on product carton, 33
8. Emissions Testing: Section 01350 Protocol, < 13.5 ppb of formaldehyde when used under typical conditions required by ASHRAE Standard 62.1-2004, "Ventilation for Acceptable Indoor Air Quality"
9. Flame Spread: ASTM E 1264; Class A (UL)
10. Light Reflectance (LR): ASTM E 1477; White Panel: Light Reflectance: 0.87.
11. Dimensional Stability: HumiGuard Plus - Temperature is between 32°F (0° C) and 120°F (49° C). It is not necessary for the area to be enclosed or for HVAC systems to be functioning. All wet work (plastering, concrete, etc) must be complete and dry.
12. Antimicrobial Protection: BioBlock Plus - Resistance against the growth of mold/mildew and gram positive and gram negative odor and stain causing bacteria.
13. Acceptable Product: Tundra, 301 as manufactured by Armstrong World Industries.

### 2.3.0 SUSPENSION SYSTEMS

- A. Components: All main beams and cross tees shall be commercial quality hot-dipped galvanized (galvanized steel, aluminum, or stainless steel) as per ASTM A 653. Main beams and cross tees are double-web steel construction with 15/16 IN type exposed flange design. Exposed surfaces chemically cleansed, capping pre-finished galvanized steel (aluminum or stainless steel) in baked polyester paint. Main beams and cross tees shall have rotary stitching (exception: extruded aluminum or stainless steel).
  1. Structural Classification: ASTM C 635 HD.
  2. Color: White and match the actual color of the selected ceiling tile, unless noted otherwise.
  3. Acceptable Product: Prelude ML 15/16" Exposed Tee as manufactured by Armstrong World Industries, Inc.
- B. Attachment Devices: Size for five times design load indicated in ASTM C 635, Table 1, Direct Hung unless otherwise indicated.
- C. Wire for Hangers and Ties: ASTM A 641, Class 1 zinc coating, soft temper, pre-stretched, with a yield stress load of at least time three design load, but not less than 12 gauge.
- D. Edge Moldings and Trim: Metal or extruded aluminum of types and profiles indicated or, if not indicated, manufacturer's standard moldings for edges and penetrations, including light fixtures, that fit type of edge detail and suspension system indicated. Provide moldings with exposed flange of the same width as exposed runner.
- E. Accessories

## PART 3 - EXECUTION

### 3.1 EXAMINATION

- A. Do not proceed with installation until all wet work such as concrete, terrazzo, plastering and painting has been completed and thoroughly dried out, unless expressly permitted by manufacturer's printed recommendations. (Exception: HumiGuard Max Ceilings)

### 3.2 PREPARATION

- A. Measure each ceiling area and establish layout of acoustical units to balance border widths at opposite edges of each ceiling. Avoid use of less than half width units at borders, and comply with reflected ceiling plans. Coordinate panel layout with mechanical and electrical fixtures.
- B. Coordination: Furnish layouts for preset inserts, clips, and other ceiling anchors whose installation is specified in other sections.
  1. Furnish concrete inserts and similar devices to other trades for installation well in advance of time needed for coordination of other work.

### 3.3 INSTALLATION

- A. Install suspension system and panels in accordance with the manufacturer's instructions, and in compliance with ASTM C 636 and with the authorities having jurisdiction.

- B. Suspend main beam from overhead construction with hanger wires spaced 4'-0" on center along the length of the main runner. Install hanger wires plumb and straight.
- C. Install wall moldings at intersection of suspended ceiling and vertical surfaces. Miter corners where wall moldings intersect or install corner caps.
- D. For reveal edge panels: Cut and reveal or rabbet edges of ceiling panels at border areas and vertical surfaces.
- E. Install acoustical panels in coordination with suspended system, with edges resting on flanges of main runner and cross tees. Cut and fit panels neatly against abutting surfaces. Support edges by wall moldings.

### **3.4 ADJUSTING AND CLEANING**

- A. Replace damaged and broken panels.
- B. Clean exposed surfaces of acoustical ceilings, including trim, edge moldings, and suspension members. Comply with manufacturer's instructions for cleaning and touch up of minor finish damage.
  - 1. Ceiling Touch-Up Paint, (Item #5760, 8oz. bottles) (Item #5761, quart size cans), "global white" latex paint should be used to hide minor scratches and nicks in the surface and to cover field tegularized edges that are exposed to view.
- C. Remove and replace work that cannot be successfully cleaned and repaired to permanently eliminate evidence of damage.

**END OF SECTION**

## SECTION 09680 - CARPETING

### PREFACE

The general provisions of the Contract, including the Conditions of the Contract (General, Supplementary and other Conditions) and Division 1 as appropriate, apply to the Work specified in this Section.

### 1.0 SCOPE

- 1.1 This Section covers the furnishings and installation of carpeting, including underlayment, reducer strips and accessories required to properly install carpeting complete, including all labor, materials, equipment and incidentals necessary and required for their completion.
- 1.2 All carpet shall be delivered to the job site in original mill wrappings with each roll having register number tags attached or register number stenciled on the bale intact. Store under cover in well ventilated spaces as soon as delivered; protect from dirt, damage, stains and moisture.
- 1.3 Surfaces to receive carpet shall be thoroughly clean, dry and in condition satisfactory to carpet installer. Moisture conditions of surface should be considered in order to determine whether adhesive used will supply bond between backing and floor.

### 2.0 MATERIALS

- 2.1 Carpet Tiles manufactured by: Milliken Contract or approved equal
  - A. Style Name : Southern Analog Collection
  - B. Style Number: Panoramic & Viewfinder
  - C. Color Number: TBS
  - D. Stain Resist: Stain Smart
  - E. Antimicrobial: Alpha - San Built-In Protection
  - F. Construction: Tufted, Textured Loop
  - G. Warranty: Lifetime Commercial Limited
  - H. Adhesive: TractionBack
  - I. Installation Method: Quarter Turn - 50 cm x 50 cm carpet tile
- 2.2 Accessories: Leveling compound: Self underlayment concrete model K-15 as manufactured by Ardex Engineered Cements, Inc. Use at uneven or damaged concrete slabs.
- 2.3 Sub-floor Filler: White premix latex, type recommended by flooring manufacturer
- 2.4 Primers and adhesives: Waterproof of types recommended by carpet manufacturer

- 2.5 Flame spread & Smoke density as per city requirements  
Contractor to submit samples for approval

### **3.0 EXECUTION**

- 3.1 WORKMANSHIP: Carpet installation must be done by men skilled in this trade. Seaming will be held to a minimum as generally practiced in this trade. Seaming shall be in accordance with manufacturer's specifications.
- 3.2 Carpet remnants and usable scraps shall be packaged, identified and delivered to the Owner as the Owner's property. Color as selected by Owner.
- 3.3 After installation is complete, clean up all dirt and debris. Clean carpet of all spots with proper spot remover. Remove loose threads with sharp scissors, and then clean with broom or vacuum cleaner. The entire installation shall be left clean and in an approved condition.

**END OF SECTION**

## SECTION 09900

### PAINTING

#### PREFACE

The general provisions of the Contract, including the Conditions of the Contract (General, Supplementary and other Conditions) and Division 1 as appropriate, apply to the Work specified in this Section.

#### 1.0 SCOPE

- 1.1 This Section covers the labor, materials, and equipment required for painting and proper finishing of:

**Interior Painting:** Gyp board walls and ceilings where they occur, wood base, steel doors and frames, exposed steel framing (columns, cross bracing, beams, attachments, angles, etc.).

**Interior Clear Sealing of Wood:** All Maple doors, cabinets, and interior walls where Maple occurs.

**Exterior Painting:** Steel columns and framework.

#### 2.0 MATERIALS

- 2.1 Where materials are specified by name, only those materials are to be used, unless the expression "or approved equal" is included in the Specifications in which case any substitution required the Architect's approval and his decision is final.
- 2.2 In general, manufacturer's names and trade names are not included in these Specifications. It is intended that only the best quality of material prepared by the manufacturer to be used in each individual case to best suit the surfaces to be covered. Materials: equal in quality to the best materials as manufactured by Benjamin Moore, DeVoe, Dupont, Pratt & Lambert, Coronado, Pittsburgh, Sherwin Williams, or Glidden. Only products of recognized standard manufacturers will be considered.
- 2.3 The number of coats specified herein is to be considered as the minimum number of coats required, and it shall be the responsibility of the Contractor for this Section of the Work to apply materials of proper type and in sufficient quantities and coats to properly cover the surface and obtain a first quality finished surface on each of the surfaces treated.

### 3.0 EXECUTION

#### 3.1 Precautions:

- .1 Provide for ventilating and drying in spaces in which painting is to be accomplished.
- .2 Do not apply paint under conditions that could adversely affect finish. Do not apply paint when surrounding temperature is below 50 degrees F. or when excessive humidity is present.
- .3 Protect painted surfaces from exposure to direct rays of sun until surface is sufficiently dry to prevent damage.

#### 3.2 Preparation of Wood:

- .1 Woodwork to be painted or finished shall be in condition before coating; surfaces being clean, smooth and dry.
- .2 Woodwork to be painted shall have all knots and pitch streaks shellacked two (2) coats before priming is applied.

#### 3.3 Mixing and Colors:

- .1 Apply paint at the consistency recommended by the Manufacturer. Additional thinning permitted only with specific approval.
- .2 Use factory mixed colors, shades and tints except as indicated. Job mixing permitted only with specific approval.
- .3 Match approved color chips or approved samples. Do not proceed with finish painting until samples have been approved.
- .4 The Owner and Architect will select colors for all areas.
- .5 The painting sub-contractor, before starting work, shall prepare and submit for the Architect's approval, a complete schedule of all makes and names of paint materials proposed for each particular use. Once approved, no change shall be made from the schedule.

#### 3.4 Application:

- .1 Apply painting materials according to manufacturer's instructions and recommendations. Spread or flow materials to produce a finish free from runs, sags, or thin spots.

- .3 Do not apply a coat over another coat until the preceding one has thoroughly dried. Do not apply additional coats until previous coat has been approved. Do not apply finish over surfaces containing excessive moisture.
- .4 Tint priming coats to approximate shade of finish. Use first coat lighter than second coat.
- .5 Make edges of paint sharp, clean and straight. Prevent overlapping of colors.
- .6 All surfaces to be painted will be inspected after being prepared and after being finished, and in each case will be subject to the review of the Architect. Any unsatisfactory work shall be put in the proper condition and where necessary the finish paint shall be removed and the surface refinished. A first-class job of painting and finishing in all particulars will be required.

3.5 Paint Finishes: Sherwin Williams or approved equal

**Interior Painting Schedule:**

- .1 Gypsum Board: Sherwin Williams  
 Prime Coat: PrepRite Classic Interior Latex Primer  
 Intermediate: SuperPaint Interior Latex Satin  
 Finish Coat: SuperPaint Interior Latex Satin
- .2 Hollow Metal Doors and Frames (where indicated):  
 Prime Coat: Kem Kromik Universal Metal Primer VOC  
 Intermediate: Pro Industrial Urethane Alkyd Enamel Semi Gloss  
 Finish Coat: Pro Industrial Urethane Alkyd Enamel Semi Gloss
- .3 Wood Trim, cabinets, doors, wood at wall (where shown as clear or natural finish):  
 Prime Coat: WoodClassics Interior Oil clear finish  
 Intermediate Coat: WoodClassics Int. Alkyd FD Sanding Sealer  
 Finish Coat: Oil Base H.R. Satin
- .4 Concrete Floor/Concrete:  
 Finish Coat: Burnished Finish. Remove all dirt, debris, grime, etc... prior to surface application.

- .5 Interior Steel -where shown/Steel unless indicated to be galvanized:  
Prime Coat: Kem Kromik Universal Metal Primer VOC  
  
Intermediate Coat: Industrial Enamel  
  
Finish Coat: Industrial Enamel
- .6 Wood Trim (where shown to be painted):  
Prime Coat: PrepRite Wall and Wood Alkyd Primer  
  
Intermediate Coat: ProClassic Interior Alkyd Semi Gloss  
  
Finish Coat: ProClassic Interior Alkyd Semi Gloss

**Exterior Painting Schedule :**

- .1 Exterior Steel unless indicated to be galvanized:  
Prime Coat: Kem Kromik Universal Metal Primer VOC  
  
Intermediate Coat: Pro Industrial Urethane Alkyd Enamel  
  
Finish Coat: Pro Industrial Urethane Alkyd Enamel
- 3.6 Miscellaneous Mechanical Equipment at Interior: To be left without paint and in its natural Finished condition.
- 3.7 Cleaning
- .1 Protect adjacent surroundings and surfaces from dropped, spattered and spilled paint.
- .2 Remove soil, stain and extraneous materials, caused by painting work from adjacent surfaces.
- .3 Remove and replace items and materials that cannot be satisfactorily cleaned.
- .4 Clean and finish painted surfaces as recommended by manufacturers of materials.

**END OF SECTION**

## **SECTION 10160**

### **TOILET PARTITIONS**

#### **PREFACE**

The general provisions of the Contract, including the Conditions of the Contract (General, Supplementary and other Conditions) and Division 1 as appropriate, apply to the Work specified in this Section.

#### **1.0 SCOPE**

##### **1.1 RELATED DOCUMENTS**

- A. Drawings and general provisions of Contract, including General and Supplementary Conditions and Division 1 Specifications Sections, apply to this Section.

##### **1.2 SUMMARY**

- A. Extent of toilet partitions is indicated on drawings.
- B. Types of toilet compartments include:
  - 1. Plastic laminate finish.
- C. Toilet accessories, such as toilet paper holders, grab bars, purse shelves, are specified elsewhere in Division 10.

##### **1.3 SUBMITTALS**

- A. Product Data: Submit manufacturer's detailed technical data for materials fabrication, and installation, including catalog cuts of anchors, hardware, fastenings, and accessories.
- B. Shop Drawings: Submit shop drawings for fabrication and erection of toilet partition assemblies not fully described by product drawings, templates, and instructions for installation of anchorage devices built into other work.
- C. Samples: Submit full range of color samples for each type of unit required. Submit 6" square samples of each color and finish on same substrate to be used in work, for color verification after selections have been made.

#### 1.4 QUALITY ASSURANCE

- A. Field Measurements: Take field measurements prior to preparation of shop drawings and fabrication where possible, to ensure proper fitting of work. However, allow for adjustments within specified tolerances whenever taking of field measurements before fabrication might delay work.
- B. Coordination: Furnish inserts and anchorages which must be built into other work for installation of toilet partitions and related work: coordinate delivery with other work to avoid delay.

### 2.0 PRODUCTS

#### 2.1 MANUFACTURERS

- A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products which may be incorporated in the work include, but are not limited to, the following:

All American Metal Corp.  
American Sanitary Partition Corp.  
Ampco Products Inc.  
Bobrick Washroom Equipment, Inc.  
Columbia Partitions, Inc.  
Flush-Metal Partition Corp.  
Global Steel Products Corp. Knickerbocker Partition Corp.  
Metpar Steel Products Corp.  
Monarch Toilet Partition, Inc.  
Santana Products Co.  
Sanymetal Products Co.

#### 2.2 MATERIALS

- A. General: Provide materials which have been selected for surface flatness and smoothness. Exposed surfaces which exhibit pitting, seam marks, roller marks, stains, discolorations, telegraphing of core material, or other imperfections on finished units are not acceptable.
- B. Plastic Laminate: NEMA Std. LD-3, minimum 0.050" thick, color and pattern as indicated or if not indicated, as selected by Architect from manufacturer's standards.
- C. Core Material for Plastic Laminate: Manufacturer's standard particleboard, in thickness to provide nominal dimension of 1" minimum for all components.
- D. Pilaster Shoes: ASTM A 167, Type 302/304 stainless steel, not less than 3" high, 20 gage, finished to match hardware.

- E. Stirrup Brackets: Manufacturer's standard design for attaching panels to walls and pilasters, either chromium-plated non ferrous cast alloy ("Zamac")
- F. Hardware and Accessories: Manufacturer's standard exposed fasteners of stainless steel, chromium-plated steel, or brass finished to match hardware, with theft resistant type heads and nuts. For concealed anchors, use hot dip galvanized cadmium plated, or other rust resistant protective coated steel.

## 2.3 FABRICATION

- A. General: Furnish standard doors, panels, screens, and pilasters fabricated for partition system unless otherwise indicated. Furnish units with cutouts, drilled holes, and internal reinforcement to receive partition mounted hardware, accessories, and grab bars, as indicated.
- B. Door Dimensions: Unless otherwise indicated, furnish 24" wide inswinging doors for ordinary toilet stalls and 32" wide (clear opening) outswinging doors at stalls equipped for use by handicapped.
- C. Plastic Laminate Partitions and Screens:
- D. General: Pressure laminate one piece face sheets to core material with no splices or joints, and with edges straight and sealed. Seal exposed core material at cutouts to protect against moisture.
- E. Overhead Braced Partitions: Furnish galvanized steel supports and leveling bolts at pilasters recommended by manufacturer to suit floor conditions. Make provisions for setting and securing continuous extruded aluminum anti-grip overhead bracing at top of each pilaster. Furnish shoe at each pilaster to conceal supports and leveling mechanism.
  - 1. Hinges: Cutout inset type, adjustable to hold door open at any angle up to 90 degrees. Provide gravity type, spring-action cam type, or concealed torsion rod type, to suit manufacturer's standards.
  - 2. Latch and Keeper: Recessed latch unit, designed for emergency access, with combination rubber-faced door strike and keeper.
  - 3. Latch and Keeper: Manufacturer's standard surface-mounted latch unit, designed for emergency access, with combination rubber faced door strike and keeper.
  - 4. Coat Hook: Manufacturer's standard unit, combination hook and rubber tipped bumper, sized to prevent door hitting mounted accessories.

5. Door Pull: Manufacturer's standard unit for out swing door.

### **3.0 EXECUTION**

#### **3.1 INSTALLATION**

- A. General: Comply with manufacturer's recommended procedures and installation sequence. Install partitions rigid, straight, plumb and level. Provide clearances of not more than 1/2" between pilasters and panels, and not more than 1" between panels and walls. Secure panels to walls with not less than two stirrup brackets attached near top and bottom of panel. Locate wall brackets so that holes for wall anchorages occur in masonry or tile joints. Secure panels to pilasters with not less than two stirrups brackets located to align with stirrup brackets located to align with stirrup brackets at wall. Secure panels in position with manufacturer's recommended anchoring devices.
- B. Overhead Braced Partitions: Secure pilasters to floor, and level, plumb and tighten installation with devices furnished. Secure overhead brace to each pilaster with not less than two fasteners. Hang doors and adjust so that tops of doors are parallel with overhead brace when doors are in closed position.
- C. Screens: attach with concealed anchoring devices, as recommended by manufacturer to suit supporting structure. Set units to provide support and to resist lateral impact.
- D. Accessories: Mount accessories to partition units in accordance with manufacturer's instructions.

#### **3.2 ADJUST AND CLEAN**

- A. Hardware Adjustment: Adjust and lubricate hardware for proper operation. Set hinges on inswinging doors to hold open approximately 30 degrees from closed position when unlatched. Set hinges on outswinging doors (and entrance swing doors) to return to fully closed position.
- B. Clean exposed surfaces of partition systems using materials and methods recommended by manufacturer, and provide protection as necessary to prevent damage during remainder of construction period.

**END OF SECTION**

**SECTION 10520****FIRE EXTINGUISHERS, CABINETS AND ACCESSORIES****PREFACE**

The general provisions of the Contract, including the Conditions of the Contract (General, Supplementary and other Conditions) and Division 1 as appropriate, apply to the Work specified in this Section.

**1.0 SCOPE**

- 1.1 This Section includes all labor, material, services, equipment and appliances required for the complete installation of:

Fire extinguishers (see plan for locations). Noted by "FEC" on the drawings.  
Cabinets  
Accessories

- 1.2 Submittals: Provide product data on extinguisher cabinet dimensions, operational features, color and finish, anchorage details and rough-in requirements.

**2.0 MATERIALS**

- 2.1 Manufacturer: Larson's Manufacturing Company
- 2.2 Cabinets: Larson's Architectural Series or approved equal, wire glass door style, Model No. 2712-R, fully recessed with 5/16" flat trim. Primed and painted white with red decal "Fire Extinguisher".
- 2.3 Fire Extinguishers: Model MP10, 10 lb. Capacity suitable for Type A, B and C fires. Provide extinguishers fully charged as indicated on drawings.
- 2.4 Accessories: Fire department lock box 4" x 6" x 1-1/2"

**3.0 EXECUTION**

- 3.1 Examination: Verify rough openings for cabinet are correctly sized and located.
- 3.2 Installation: Install in accordance with manufacturer's instructions. Install cabinets plumb and level in wall openings, 40" from finished floor to top of door handle. Secure rigidly in place.

**END OF SECTION**

**SECTION 10800****TOILET ACCESSORIES****PREFACE**

The general provisions of the Contract, including the Conditions of the Contract (General, Supplementary and other Conditions) and Division 1 as appropriate, apply to the Work specified in this Section.

**1.0 SCOPE**

- 1.1 This Section includes all labor, material, services and equipment required for the complete installation of:
  - Toilet Accessories
  - Attachment Hardware
- 1.2 Products furnished but installed under this section:
  - Metal Fabrication: Installation of backing plate reinforcement
  - Rough Carpentry: Installation of concealed anchor devices.
- 1.3 Submittals: Provide product data on accessories describing size, finish, and details of function, attachment methods. Submit manufacturer's installation instructions and color samples as necessary for selection by architect.

**2.0 MATERIALS**

- 2.1 Manufacturer: Bobrick or approved equal
  - Toilet Paper Holder
  - Grab Bars to be Kohler "Purist" polished chrome in lengths as noted on plans.
  - Liquid Soap Dispenser
  - Coat Hook
  - Feminine Napkin Disposal
  - Framed Mirror
- 2.2 Products:
  - Stainless Steel Sheet: ASTM A167, Type 304
  - Tubing: ASTM A269, stainless steel
  - Adhesive: Contact type waterproof
  - Fasteners, Screws, and Bolts: Hot dip galvanized, tamperproof
  - Primer: As recommended by manufacturer

**2.3 Fabrication:**

Weld and grind smooth joints of fabricated components.  
Form exposed surfaces from single sheet of stock, free of joints.  
Form surfaces flat without distortion. Maintain flat surfaces without scratches or dents. Back paint components where contact is made with building finishes to prevent electrolysis. Shop assemble components and package complete with anchors and fittings. Provide steel anchor plates, adapters and anchor components for installation. Hot dip galvanize exposed and painted ferrous metal and fastening device.

**3.0 EXECUTION**

- 3.1 Examination: Verify that site conditions are ready to receive work and dimensions are as indicated on shop drawings and as instructed by the manufacturer.
- 3.2 Preparation: Deliver inserts and rough-in frames to site at appropriate time for building-in. Provide templates and rough-in measurements as required. Verify exact location of accessories for installation.
- 3.3 Installation: Install in accordance with manufacturer's instructions. Install plumb and level, securely and rigidly anchored to substrate.

**END OF SECTION**

## SECTION 13121 - METAL BUILDING SYSTEMS

### PART 1 - GENERAL

#### 1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

#### 1.2 SUMMARY

- A. This Section includes metal building systems that consist of integrated sets of mutually dependent components including structural framing and accessories.
- B. Related Sections include the following:
  - 1. Division 3 Section "Cast-in-Place Concrete" for concrete foundations, slabs, and anchor-bolt installation.
  - 2. Division 7 Section "Building Insulation" for insulation installed in roof and wall panel assemblies.
  - 3. Division 7 Section "Sheet Metal Roofing" for factory-formed metal roof panels.
  - 4. Division 8 Section "Steel Doors and Frames".
  - 5. Division 8 Section "Sectional Overhead Doors."
  - 6. Division 8 Section "Aluminum Windows."
  - 7. Division 8 Section "Door Hardware".
  - 8. Division 9 Section "Gypsum Board Assemblies" for installing gypsum board as part of metal panel assemblies.
  - 9. Division 9 painting Sections for finish painting of shop-primed structural framing.
  - 10. Division 10 Section "Louvers and Vents" for metal louvers.

#### 1.3 DEFINITIONS

- A. Bay: Dimension between main frames measured normal to frame (at centerline of frame) for interior bays, and dimension from centerline of first interior main frame measured normal to end wall (outside face of end-wall girt) for end bays.

- B. Building Length: Dimension of the building measured perpendicular to main framing from end wall to end wall (outside face of girt to outside face of girt).
- C. Building Width: Dimension of the building measured parallel to main framing from sidewall to sidewall (outside face of girt to outside face of girt).
- D. Clear Span: Distance between supports of beams, girders, or trusses (measured from lowest level of connecting area of a column and a rafter frame or knee).
- E. Eave Height: Vertical dimension from finished floor to eave (the line along the sidewall formed by intersection of the planes of the roof and wall).
- F. Clear Height under Structure: Vertical dimension from finished floor to lowest point of any part of primary or secondary structure, not including crane supports, located within clear span.
- G. Terminology Standard: Refer to MBMA's "Metal Building Systems Manual" for definitions of terms for metal building system construction not otherwise defined in this Section or in referenced standards.

#### 1.4 SYSTEM DESCRIPTION

- A. General: Provide a complete, integrated set of mutually dependent components and assemblies that form a metal building system capable of withstanding structural and other loads, thermally induced movement, and exposure to weather without failure or infiltration of water into building interior. Include primary and secondary framing and accessories complying with requirements indicated.
  - 1. Provide metal building system of size and with spacings, slopes, and spans indicated.
- B. Primary Frame Type:
  - 1. Rigid Clear Span: Solid-member, structural-framing system without interior columns
  - 2. Lean To: Solid- or truss-member, structural-framing system without interior columns, designed to be partially supported by another structure.

- C. End-Wall Framing: Manufacturer's standard, for buildings not required to be expandable, consisting of primary frame, capable of supporting one-half of a bay design load, and end-wall columns
- D. Secondary Frame Type: Manufacturer's standard purlins and joists and girts.
- E. Eave Height: refer to drawings.
- F. Bay Spacing: refer to drawings.
- G. Roof Slope: Refer to drawings.

## 1.5 SYSTEM PERFORMANCE REQUIREMENTS

- A. Structural Performance: Provide metal building systems capable of withstanding the effects of gravity loads and the following loads and stresses within limits and under conditions indicated:
  - 1. Engineer metal building systems according to procedures in MBMA's "Metal Building Systems Manual."
  - 2. Design Loads: As indicated.
  - 3. Live Loads: Include vertical loads induced by the building occupancy indicated on Drawings. Include loads induced by maintenance workers, materials, and equipment for roof live loads.
    - a. Building Occupancy: As indicated on Drawings.
  - 4. Roof Snow Loads: Refer to Drawings.
  - 5. Wind Loads: Refer to Drawings.
  - 6. Collateral Loads: Include additional dead loads other than the weight of metal building system for permanent items such as sprinklers, mechanical systems, electrical systems, and ceilings.
  - 7. Auxiliary Loads: Include dynamic live loads, such as those generated by cranes and materials-handling equipment indicated on Drawings.
  - 8. Load Combinations: Design metal building systems to withstand the most critical effects of load factors and load combinations as required.
  - 9. Deflection Limits: Engineer assemblies to withstand design live loads with deflections no greater than the following:
    - a. Purlins and Rafters: Vertical deflection of **1/240** of the span.
    - b. Girts: Horizontal deflection of **1/240** of the span. At areas to receive cement plaster wall finish, limit deflection to **1/360** of the span.

10. Design secondary framing system to accommodate deflection of primary building structure and construction tolerances, and to maintain clearances at openings.

- B. Seismic Performance: Design and engineer metal building systems capable of withstanding the effects of earthquake motions determined according to ASCE 7, "Minimum Design Loads for Buildings and Other Structures": Section 9, "Earthquake Loads."

## 1.6 SUBMITTALS

- A. Product Data: Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for each type of the following metal building system components:
  1. Structural-framing system.
  2. Accessories.
- B. Shop Drawings: For the following metal building system components. Include plans, elevations, sections, details, and attachments to other work.
  1. For installed products indicated to comply with design loads, include structural analysis data signed and sealed by the qualified professional engineer responsible for their preparation.
  2. Anchor-Bolt Plans: Submit anchor-bolt plans before foundation work begins. Include location, diameter, and projection of anchor bolts required to attach metal building to foundation. Indicate column reactions at each location.
  3. Structural-Framing Drawings: Show complete fabrication of primary and secondary framing; include provisions for openings. Indicate welds and bolted connections, distinguishing between shop and field applications. Include transverse cross-sections.
    - a. Show provisions for attaching **roof curbs and pipe racks**.
  4. Accessory Drawings: Include details of the following items, at a scale of not less than 1-1/2 inches per 12 inches (1:8).
    - a. Flashing and trim.
    - b. Gutters.
    - c. Downspouts.

- d. Roof ventilators.
  - e. Louvers.
  - f. Service walkways.
- C. Samples for Initial Selection: For each type of building component with factory-applied color finish.
- D. Samples for Verification: For each type of exposed finish required, prepared on Samples of sizes indicated below.
  - 1. Flashing and Trim: Nominal 12 inches (300 mm) long. Include fasteners and other exposed accessories.
  - 2. Accessories: Nominal 12-inch- (300-mm-) long Samples for each type of accessory.
- E. Product Certificates: For each type of metal building system, signed by product manufacturer.
  - 1. Letter of Design Certification: Signed and sealed by a qualified professional engineer. Include the following:
    - a. Name and location of Project.
    - b. Order number.
    - c. Name of manufacturer.
    - d. Name of Contractor.
    - e. Building dimensions including width, length, height, and roof slope.
    - f. Indicate compliance with AISC standards for hot-rolled steel and AISI standards for cold-rolled steel, including edition dates of each standard.
    - g. Governing building code and year of edition.
    - h. Design Loads: Include dead load, roof live load, collateral loads, roof snow load, deflection, wind loads/speeds and exposure, seismic design category or effective peak velocity-related acceleration/peak acceleration, and auxiliary loads (cranes).
    - i. Load Combinations: Indicate that loads were applied acting simultaneously with concentrated loads, according to governing building code.
    - j. Column base plate loads: Based on loads/ load combinations identified in h & i.
    - k. Building-Use Category: Indicate category of building use and its effect on load importance factors.

- I. AISC Certification for Category MB: Include statement that metal building system and components were designed and produced in an AISC-Certified Facility by an AISC-Certified Manufacturer.
- F. Welding certificates.
- G. Erector Certificate: Signed by manufacturer certifying that erector complies with requirements.
- H. Manufacturer Certificate: Signed by manufacturer certifying that products comply with requirements.
- I. Qualification Data: For firms and persons specified in "Quality Assurance" Article to demonstrate their capabilities and experience. Include lists of completed projects with project names and addresses, names and addresses of architects and owners, and other information specified.
- J. Material Test Reports: Signed by manufacturers certifying that the following products comply with requirements:
  - 1. Structural steel including chemical and physical properties.
  - 2. Bolts, nuts, and washers including mechanical properties and chemical analysis.
  - 3. Tension-control, high-strength, bolt-nut-washer assemblies.
  - 4. Shop primers.
  - 5. Nonshrink grout.
- K. Source quality-control test reports.
- L. Field quality-control test reports.
- M. Product Test Reports: Based on evaluation of comprehensive tests performed by manufacturer and witnessed by a qualified testing agency, for insulation and vapor retarders. Include reports for thermal resistance, fire-test-response characteristics, water-vapor transmission, and water absorption.
- N. Surveys: Show final elevations and locations of major members. Indicate discrepancies between actual installation and the Contract Documents. Have surveyor who performed surveys certify their accuracy.
- O. Warranties: Special warranties specified in this Section.
- P. Other Action Submittals:

1. Door Schedule: For doors and frames. Use same designations indicated on Drawings. Include details of reinforcement.
  - a. Door Hardware Schedule: Include details of fabrication and assembly of door hardware. Organize schedule into door hardware sets indicating complete designations of every item required for each door or opening.
  - b. Keying Schedule: Detail Owner's final keying instructions for locks. Include schematic keying diagram and index each key set to unique door designations.

## 1.7 QUALITY ASSURANCE

- A. Erector Qualifications: An experienced erector who has specialized in erecting and installing work similar in material, design, and extent to that indicated for this Project and who is acceptable to manufacturer.
- B. Manufacturer Qualifications: A qualified manufacturer and member of MBMA.
  1. AISC Certification for Category MB: An AISC-Certified Manufacturer that designs and produces metal building systems and components in an AISC-Certified Facility.
  2. Engineering Responsibility: Preparation of Shop Drawings and comprehensive engineering analysis by a qualified professional engineer.
- C. Land Surveyor Qualifications: A professional land surveyor who is legally qualified to practice in jurisdiction where Project is located and who is experienced in providing surveying services of the kind indicated.
- D. Testing Agency Qualifications: An independent agency qualified according to ASTM E 329 for testing indicated, as documented according to ASTM E 548.
- E. Source Limitations: Obtain primary metal building system components, including structural framing and metal panel assemblies, through one source from a single manufacturer.
- F. Product Options: Drawings indicate size, profiles, and dimensional requirements of metal building system and are based on the specific system indicated. Refer to Division 1 Section "Product Requirements."
  1. Do not modify intended aesthetic effects, as judged solely by Architect, except with Architect's approval. If modifications are proposed, submit comprehensive explanatory data to Architect for review.

- G. Welding: Qualify procedures and personnel according to AWS D1.1, "Structural Welding Code--Steel," and AWS D1.3, "Structural Welding Code--Sheet Steel."
- H. Structural Steel: Comply with AISC's "Specification for Structural Steel Buildings--Allowable Stress Design, Plastic Design," or AISC's "Load and Resistance Factor Design Specification for Structural Steel Buildings," for design requirements and allowable stresses.
- I. Cold-Formed Steel: Comply with AISI's "Specification for the Design of Cold-Formed Steel Structural Members," or AISI's "Load and Resistance Factor Design Specification for Steel Structural Members," for design requirements and allowable stresses.
- J. Pre-Erection Conference: Conduct conference at Project site to comply with requirements in Division 1 Section "Project Management and Coordination." Review methods and procedures related to metal building systems including, but not limited to, the following:
  - 1. Inspect and discuss condition of foundations and other preparatory work performed by other trades.
  - 2. Review structural load limitations.
  - 3. Review and finalize construction schedule and verify availability of materials, Erector's personnel, equipment, and facilities needed to make progress and avoid delays.
  - 4. Review required testing, inspecting, and certifying procedures.
  - 5. Review weather and forecasted weather conditions and procedures for unfavorable conditions.

## 1.8 DELIVERY, STORAGE, AND HANDLING

- A. Deliver components, sheets, panels, and other manufactured items so as not to be damaged or deformed. Package metal panels for protection during transportation and handling.
- B. Unload, store, and erect metal panels in a manner to prevent bending, warping, twisting, and surface damage.
- C. Stack metal panels horizontally on platforms or pallets, covered with suitable weathertight and ventilated covering. Store metal panels to ensure dryness and with positive slope for drainage of water. Do not store metal panels in contact with other materials that might cause staining, denting, or other surface damage.
- D. Protect foam-plastic insulation as follows:

1. Do not expose to sunlight, except to extent necessary for period of installation and concealment.
2. Protect against ignition at all times. Do not deliver foam-plastic insulation materials to Project site before installation time.
3. Complete installation and concealment of plastic materials as rapidly as possible in each area of construction.

## 1.9 PROJECT CONDITIONS

- A. Weather Limitations: Proceed with installation only when weather conditions permit metal panels to be installed according to manufacturers' written instructions and warranty requirements.
- B. Field Measurements:
  1. Established Dimensions for Foundations: Comply with established dimensions on approved anchor-bolt plans, establishing foundation dimensions and proceeding with fabricating structural framing without field measurements. Coordinate anchor-bolt installation to ensure that actual anchorage dimensions correspond to established dimensions.

## 1.10 COORDINATION

- A. Coordinate size and location of concrete foundations and casting of anchor-bolt inserts into foundation walls and footings. Concrete, reinforcement, and formwork requirements are specified in Division 3 Section "Cast-in-Place Concrete."
- B. Coordinate installation of roof curbs, equipment supports, and roof penetrations, which are specified in Division 7 Section "Roof Accessories."
- C. Coordinate sheet metal assemblies with rain drainage work, flashing, trim, and construction of supports and other adjoining work to provide a leakproof, secure, and noncorrosive installation.

## 2.1 MANUFACTURERS

- A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
1. Butler Manufacturing Company.
  2. Ceco Building Systems; Division of Robertson-Ceco Corporation.
  3. Gulf States Manufacturers, Inc.
  4. Mesco Metal Buildings; Division of NCI Building Systems, LLP.
  5. Metallic Metal Building Company; Division of NCI Building Systems, LLP.
  6. VP Buildings, Inc.; a United Dominion Company.

## 2.2 STRUCTURAL-FRAMING MATERIALS

- A. W-Shapes: ASTM A 992/A 992M; ASTM A 572/A 572M, Grade 50 or 55 (345 or 380); or ASTM A 529/A 529M, Grade 50 or 55 (345 or 380).
- B. Channels, Angles, M-Shapes, and S-Shapes: ASTM A 36/A 36M; ASTM A 572/A 572M, Grade 50 or 55 (345 or 380); or ASTM A 529/A 529M, Grade 50 or 55 (345 or 380).
- C. Plate and Bar: ASTM A 36/A 36M; ASTM A 572/A 572M, Grade 50 or 55 (345 or 380); or ASTM A 529/A 529M, Grade 50 or 55 (345 or 380).
- D. Steel Pipe: ASTM A 53/A 53M, Type E or S, Grade B.
- E. Cold-Formed Hollow Structural Sections: ASTM A 500, Grade B or C, structural tubing.
- F. Structural-Steel Sheet: Hot-rolled, ASTM A 1011/A 1011M, Structural Steel (SS), Grades 30 through 55 (205 through 380), or High-Strength Low Alloy Steel (HSLAS), Grades 45 through 70 (310 through 480); or cold-rolled, ASTM A 1008/A 1008M, Structural Steel (SS), Grades 25 through 80 (170 through 550), or High-Strength Low Alloy Steel (HSLAS), Grades 45 through 70 (310 through 480).
- G. Metallic-Coated Steel Sheet: ASTM A 653/A 653M, Structural Steel (SS), Grades 33 through 80 (230 through 550) or High-Strength Low Alloy Steel

(HSLAS), Grades 50 through 80 (340 through 550); with G60 (Z180) coating designation; mill phosphatized.

- H. **Metallic-Coated Steel Sheet Prepainted with Coil Coating:** Steel sheet metallic coated by the hot-dip process and prepainted by the coil-coating process to comply with ASTM A 755/A 755M.
1. **Zinc-Coated (Galvanized) Steel Sheet:** ASTM A 653/A 653M, Structural Steel (SS), Grades 33 through 80 (230 through 550) or High-Strength Low Alloy Steel (HSLAS), Grades 50 through 80 (340 through 550); with G90 (Z275) coating designation.
  2. **Aluminum-Zinc Alloy-Coated Steel Sheet:** ASTM A 792/A 792M, Structural Steel (SS), Grade 50 or 80 (340 or 550); with Class AZ50 (AZM150) coating.
- I. **Non-High-Strength Bolts, Nuts, and Washers:** ASTM A 307, Grade A (ASTM F 568M, Property Class 4.6), carbon-steel, hex-head bolts; ASTM A 563 (ASTM A 563M) carbon-steel hex nuts; and ASTM F 844 plain (flat) steel washers.
1. **Finish:** Hot-dip zinc coating, ASTM A 153/A 153M, Class C.
- J. **High-Strength Bolts, Nuts, and Washers:** ASTM A 325 (ASTM A 325M), Type 1, heavy hex steel structural bolts; ASTM A 563 (ASTM A 563M) heavy hex carbon-steel nuts; and ASTM F 436 (ASTM F 436M) hardened carbon-steel washers.
1. **Finish:** Hot-dip zinc coating, ASTM A 153/A 153M, Class C.
  2. **Tension-Control, High-Strength Bolt-Nut-Washer Assemblies:** ASTM F 1852, Type 1, heavy-hex-head steel structural bolts with splined ends.
    - a. **Finish:** Mechanically deposited zinc coating, ASTM B 695, Class 50.
- K. **High-Strength Bolts, Nuts, and Washers:** ASTM A 490 (ASTM A 490M), Type 1, heavy hex steel structural bolts; ASTM A 563 (ASTM A 563M) heavy hex carbon-steel nuts; and ASTM F 436 (ASTM F 436M) hardened carbon-steel washers, plain.
- L. **Unheaded Anchor Rods:** [ASTM F 1554, Grade 36] [ASTM A 572/A 572M, Grade 50 (345)] [ASTM A 36/A 36M] [ASTM A 307, Grade A (ASTM F 568M, Property Class 4.6)].
1. **Configuration:** Straight.
  2. **Nuts:** ASTM A 563 (ASTM A 563M) [heavy] hex carbon steel.

3. Plate Washers: ASTM A 36/A 36M carbon steel.
  4. Washers: ASTM F 436 (ASTM F 436M) hardened carbon steel.
  5. Finish: [Plain] [Hot-dip zinc coating, ASTM A 153/A 153M, Class C] [Mechanically deposited zinc coating, ASTM B 695, Class 50].
- M. Headed Anchor Rods: [ASTM F 1554, Grade 36] [ASTM A 307, Grade A (ASTM F 568M, Property Class 4.6)], straight.
1. Nuts: ASTM A 563 (ASTM A 563M) [heavy] hex carbon steel.
  2. Plate Washers: ASTM A 36/A 36M carbon steel.
  3. Washers: ASTM F 436 (ASTM F 436M) hardened carbon steel.
  4. Finish: [Plain] [Hot-dip zinc coating, ASTM A 153/A 153M, Class C] [Mechanically deposited zinc coating, ASTM B 695, Class 50].
- N. Threaded Rods: [ASTM A 193/A 193M] [ASTM A 572/A 572M, Grade 50 (345)] [ASTM A 36/A 36M] [ASTM A 307, Grade A (ASTM F 568M, Property Class 4.6)].
1. Nuts: ASTM A 563 (ASTM A 563M) [heavy] hex carbon steel.
  2. Washers: [ASTM F 436 (ASTM F 436M) hardened] [ASTM A 36/A 36M] carbon steel.
  3. Finish: [Plain] [Hot-dip zinc coating, ASTM A 153/A 153M, Class C] [Mechanically deposited zinc coating, ASTM B 695, Class 50].
- O. Primer: SSPC-Paint 15, Type I, red oxide.

## 2.3 MISCELLANEOUS MATERIALS

- A. Fasteners: Self-tapping screws, bolts, nuts, self-locking rivets and bolts, end-welded studs, and other suitable fasteners designed to withstand design loads. Provide fasteners with heads matching color of materials being fastened by means of plastic caps or factory-applied coating.
1. Fasteners for Metal Roof Panels: Self-drilling or self-tapping, zinc-plated, hex-head carbon-steel screws, with a stainless-steel cap or zinc-aluminum-alloy head and EPDM or neoprene sealing washer.
  2. Fasteners for Flashing and Trim: Blind fasteners or self-drilling screws with hex washer head.
  3. Blind Fasteners: High-strength aluminum or stainless-steel rivets.
- B. Bituminous Coating: Cold-applied asphalt mastic, SSPC-Paint 12, compounded for 15-mil (0.4-mm) dry film thickness per coat. Provide inert-type noncorrosive compound free of asbestos fibers, sulfur components, and other deleterious impurities.

## 2.4 FABRICATION, GENERAL

- A. General: Design components and field connections required for erection to permit easy assembly.
  - 1. Mark each piece and part of the assembly to correspond with previously prepared erection drawings, diagrams, and instruction manuals.
  - 2. Fabricate structural framing to produce clean, smooth cuts and bends. Punch holes of proper size, shape, and location. Members shall be free of cracks, tears, and ruptures.
- B. Tolerances: Comply with MBMA's "Metal Building Systems Manual": Chapter IV, Section 9, "Fabrication and Erection Tolerances."

## 2.5 STRUCTURAL FRAMING

- A. General:
  - 1. Primary Framing: Shop fabricate framing components to indicated size and section with baseplates, bearing plates, stiffeners, and other items required for erection welded into place. Cut, form, punch, drill, and weld framing for bolted field assembly.
    - a. Make shop connections by welding or by using high-strength bolts.
    - b. Join flanges to webs of built-up members by a continuous submerged arc-welding process.
    - c. Brace compression flange of primary framing with steel angles or cold-formed structural tubing between frame web and purlin or girt web, so flange compressive strength is within allowable limits for any combination of loadings.
    - d. Weld clips to frames for attaching secondary framing members.
    - e. Shop Priming: Prepare surfaces for shop priming according to SSPC-SP 2. Shop prime primary structural members with specified primer after fabrication.
  - 2. Secondary Framing: Shop fabricate framing components to indicated size and section by roll-forming or break-forming, with baseplates, bearing plates, stiffeners, and other plates required for erection welded into place. Cut, form, punch, drill, and weld secondary framing for bolted field connections to primary framing.
    - a. Make shop connections by welding or by using non-high-strength bolts.

- b. Shop Priming: Prepare uncoated surfaces for shop priming according to SSPC-SP 2. Shop prime uncoated secondary structural members with specified primer after fabrication.
- B. Primary Framing: Manufacturer's standard structural primary framing system, designed to withstand required loads and specified requirements. Primary framing includes transverse and lean-to frames; rafter, rake, and canopy beams; sidewall, intermediate, end-wall, and corner columns; and wind bracing.
  - 1. General: Provide frames with attachment plates, bearing plates, and splice members. Factory drill for field-bolted assembly. Provide frame span and spacing indicated.
    - a. Slight variations in span and spacing may be acceptable if necessary to meet manufacturer's standard, as approved by Architect.
  - 2. Rigid Clear-Span Frames: I-shaped frame sections fabricated from shop-welded, built-up steel plates or structural-steel shapes. Interior columns are not permitted.
  - 3. Rigid Modular Frames: I-shaped frame sections fabricated from shop-welded, built-up steel plates or structural-steel shapes. Provide interior columns fabricated from round steel pipe or tube, or shop-welded, built-up steel plates.
  - 4. Frame Configuration: Lean to, with high side connected to, and supported by, another structure, and Multiple gable.
  - 5. Exterior Column Type: Tapered.
- C. End-Wall Framing: Manufacturer's standard primary end-wall framing fabricated for field-bolted assembly to comply with the following:
  - 1. End-Wall and Corner Columns: I-shaped sections fabricated from structural-steel shapes; shop-welded, built-up steel plates; or C-shaped, cold-formed, structural-steel sheet; with minimum thickness of 0.0598 inch (1.5 mm).
  - 2. End-Wall Rafters: C-shaped, cold-formed, structural-steel sheet; with minimum thickness of 0.0598 inch (1.5 mm); or I-shaped sections fabricated from shop-welded, built-up steel plates or structural-steel shapes.
- D. Secondary Framing: Manufacturer's standard secondary framing members, including purlins, girts, eave struts, flange bracing, base members, gable angles, clips, headers, jambs, and other miscellaneous structural members. Fabricate framing from cold-formed, structural-steel sheet or roll-formed, metallic-coated

steel sheet prepainted with coil coating, unless otherwise indicated, to comply with the following:

1. Purlins: C- or Z-shaped sections; fabricated from minimum 0.0598-inch- (1.5-mm-) thick steel sheet, built-up steel plates, or structural-steel shapes; minimum 2-1/2-inch- (64-mm-) wide flanges.
    - a. Depth: As required to comply with system performance requirements.
  2. Girts: C- or Z-shaped sections; fabricated from minimum 0.0598-inch- (1.5-mm-) thick steel sheet, built-up steel plates, or structural-steel shapes. Form ends of Z-sections with stiffening lips angled 40 to 50 degrees to flange and with minimum 2-1/2-inch- (64-mm-) wide flanges.
    - a. Depth: As required to comply with system performance requirements.
  3. Eave Struts: Unequal-flange, C-shaped sections; fabricated from 0.0598-inch- (1.5-mm-) thick steel sheet, built-up steel plates, or structural-steel shapes; to provide adequate backup for metal panels.
  4. Flange Bracing: Minimum 2-by-2-by-1/8-inch (51-by-51-by-3-mm) structural-steel angles or 1-inch (25-mm) diameter, cold-formed structural tubing to stiffen primary frame flanges.
  5. Sag Bracing: Minimum 1-by-1-by-1/8-inch (25-by-25-by-3-mm) structural-steel angles.
  6. Base or Sill Angles: Minimum 3-by-2-by-0.0598-inch (76-by-51-by-1.5-mm) zinc-coated (galvanized) steel sheet.
  7. Purlin and Girt Clips: Minimum 0.0598-inch- (1.5-mm-) thick, steel sheet. Provide galvanized clips where clips are connected to galvanized framing members.
  8. Secondary End-Wall Framing: Manufacturer's standard sections fabricated from minimum 0.0598-inch- (1.5-mm-) thick, [zinc-coated (galvanized) steel sheet] [structural-steel sheet].
  9. Framing for Openings: Channel shapes; fabricated from minimum 0.0598-inch- (1.5-mm-) thick, cold-formed, structural-steel sheet or structural-steel shapes. Frame head and jamb of door openings, and head, jamb, and sill of other openings.
  10. Miscellaneous Structural Members: Manufacturer's standard sections fabricated from cold-formed, structural-steel sheet; built-up steel plates; or zinc-coated (galvanized) steel sheet; designed to withstand required loads.
- E. Canopy Framing: Manufacturer's standard structural-framing system, designed to withstand required loads, fabricated from shop-welded, built-up steel plates or

structural-steel shapes. Provide frames with attachment plates and splice members, factory drilled for field-bolted assembly.

1. Type: As indicated.

F. Bracing: Provide adjustable wind bracing as follows:

1. Rods: ASTM A 36/A 36M; ASTM A 572/A 572M, Grade 50 (345); or ASTM A 529/A 529M, Grade 50 (345); minimum 1/2-inch- (13-mm-) diameter steel; threaded full length or threaded a minimum of 6 inches (152 mm) at each end.
2. Cable: ASTM A 475, 1/4-inch- (6-mm-) diameter, extra-high-strength grade, Class B zinc-coated, 7-strand steel; with threaded end anchors.
3. Angles: Fabricated from structural-steel shapes to match primary framing, of size required to withstand design loads.
4. Rigid Portal Frames: Fabricate from shop-welded, built-up steel plates or structural-steel shapes to match primary framing; of size required to withstand design loads.
5. Fixed-Base Columns: Fabricate from shop-welded, built-up steel plates or structural-steel shapes to match primary framing; of size required to withstand design loads.
6. Diaphragm Action of Metal Panels: Design metal building to resist wind forces through diaphragm action of metal panels.
7. Bracing: Provide wind bracing using any method specified above, at manufacturer's option.

G. Bolts: Provide plain finish bolts for structural-framing components that are primed or finish painted. Provide hot-dipped galvanized bolts for structural-framing components that are galvanized.

H. Factory-Primed Finish: Apply specified primer immediately after cleaning and pretreating.

1. Prime primary, secondary, and end-wall structural-framing members to a minimum dry film thickness of 1 mil (0.025 mm).
  - a. Prime secondary steel framing formed from uncoated steel sheet to a minimum dry film thickness of 0.5 mil (0.013 mm) on each side.
2. Prime galvanized members with specified primer, after phosphoric acid pretreatment.

## 2.6 METAL ROOF PANELS

- A. Refer to Section 07610 "Sheet Metal Roofing".

## 2.7 METAL SOFFIT PANELS

- A. Refer to Section 07610 "Sheet Metal Roofing". (Addendum 2)

## 2.8 ACCESSORIES

- A. General: Provide accessories as standard with metal building system manufacturer and as specified. Fabricate and finish accessories at the factory to greatest extent possible, by manufacturer's standard procedures and processes. Comply with indicated profiles and with dimensional and structural requirements.
  - 1. Form exposed sheet metal accessories that are without excessive oil canning, buckling, and tool marks and that are true to line and levels indicated, with exposed edges folded back to form hems.
- B. Flashing and Trim: Formed from minimum 0.0159-inch- (0.40-mm-) thick, metallic-coated steel sheet or aluminum-zinc alloy-coated steel sheet prepainted with coil coating; finished to match adjacent metal panels.
  - 1. Provide flashing and trim as required to seal against weather and to provide finished appearance. Locations include, but are not limited to, eaves, rakes, corners, bases, framed openings, ridges, fasciae, and fillers.
  - 2. Opening Trim: Minimum 0.0269-inch- (0.70-mm-) thick, metallic-coated steel sheet or aluminum-zinc alloy-coated steel sheet prepainted with coil coating. Trim head and jamb of door openings, and head, jamb, and sill of other openings.
- C. Gutters: Formed from minimum 0.0159-inch- (0.40-mm-) thick, metallic-coated steel sheet or aluminum-zinc alloy-coated steel sheet prepainted with coil coating; finished to match roof fascia and rake trim. Match profile of gable trim, complete with end pieces, outlet tubes, and other special pieces as required. Fabricate in minimum 96-inch- (2438-mm-) long sections, sized according to SMACNA's "Architectural Sheet Metal Manual."
  - 1. Gutter Supports: Fabricated from same material and finish as gutters; spaced 36 inches (900 mm) o.c.
  - 2. Strainers: Bronze, copper, or aluminum wire ball type at outlets.

- D. Downspouts: Formed from 0.0159-inch- (0.4-mm-) thick, zinc-coated (galvanized) steel sheet or aluminum-zinc alloy-coated steel sheet prepainted with coil coating; finished to match metal wall panels. Fabricate in minimum 10-foot- (3-m-) long sections, complete with formed elbows and offsets.
  - 1. Mounting Straps: Fabricated from same material and finish as gutters; spaced 10 feet (3 m) o.c.
- E. Louvers: Refer to Section 10200 "Louvers & Vents".

## 2.9 FINISHES, GENERAL

- A. Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.
- B. Appearance of Finished Work: Variations in appearance of abutting or adjacent pieces are acceptable if they are within one-half of the range of approved Samples. Noticeable variations in the same piece are not acceptable. Variations in appearance of other components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.

## 2.10 SOURCE QUALITY CONTROL

- A. Testing Agency: Contractor shall engage a qualified testing and inspecting agency to perform the following tests and inspections and to submit reports.
- B. Special Inspector: Owner will engage a qualified special inspector to perform the following tests and inspections and to submit reports. Special Inspector will verify that manufacturer maintains detailed fabrication and quality-control procedures and will review the completeness and adequacy of those procedures to perform the Work.
  - 1. Special inspections will not be required if fabrication is performed by a manufacturer registered and approved by authorities having jurisdiction to perform such Work without special inspection.
    - a. After fabrication, submit certificate of compliance with copy to authorities having jurisdiction certifying that Work was performed according to Contract requirements.
- C. Tests and Inspections:

1. Bolted Connections: Shop-bolted connections shall be tested and inspected according to RCSC's "Specification for Structural Joints Using ASTM A 325 or A 490 Bolts."
  2. Welded Connections: In addition to visual inspection, shop-welded connections shall be tested and inspected according to AWS D1.1 and the following inspection procedures, at inspector's option:
    - a. Liquid Penetrant Inspection: ASTM E 165.
    - b. Magnetic Particle Inspection: ASTM E 709; performed on root pass and on finished weld. Cracks or zones of incomplete fusion or penetration will not be accepted.
    - c. Ultrasonic Inspection: ASTM E 164.
    - d. Radiographic Inspection: ASTM E 94.
- D. Correct deficiencies in Work that test reports and inspections indicate do not comply with the Contract Documents.

## PART 3 - EXECUTION

### 3.1 EXAMINATION

- A. Examine substrates, areas, and conditions, with Erector present, for compliance with requirements for installation tolerances and other conditions affecting performance of work.

### 3.2 PREPARATION

- A. Clean and prepare surfaces to be painted according to manufacturer's written instructions for each particular substrate condition.
- B. Provide temporary shores, guys, braces, and other supports during erection to keep structural framing secure, plumb, and in alignment against temporary construction loads and loads equal in intensity to design loads. Remove temporary supports when permanent structural framing, connections, and bracing are in place, unless otherwise indicated.

### 3.3 ERECTION OF STRUCTURAL FRAMING

- A. Erect metal building system according to manufacturer's written erection instructions and erection drawings.

- B. Do not field cut, drill, or alter structural members without written approval from metal building system manufacturer's professional engineer.
- C. Set structural framing accurately in locations and to elevations indicated and according to AISC specifications referenced in this Section. Maintain structural stability of frame during erection.
- D. Base Plates: Clean concrete- and masonry-bearing surfaces of bond-reducing materials, and roughen surfaces prior to setting plates. Clean bottom surface of plates.
  - 1. Set plates for structural members on wedges, shims, or setting nuts as required.
  - 2. Tighten anchor rods after supported members have been positioned and plumbed. Do not remove wedges or shims but, if protruding, cut off flush with edge of plate before packing with grout.
  - 3. Promptly pack grout solidly between bearing surfaces and plates so no voids remain. Neatly finish exposed surfaces; protect grout and allow to cure. Comply with manufacturer's written installation instructions for shrinkage-resistant grouts.
- E. Align and adjust structural framing before permanently fastening. Before assembly, clean bearing surfaces and other surfaces that will be in permanent contact with framing. Perform necessary adjustments to compensate for discrepancies in elevations and alignment.
  - 1. Level and plumb individual members of structure.
  - 2. Make allowances for difference between temperature at time of erection and mean temperature when structure will be completed and in service.
- F. Primary Framing and End Walls: Erect framing true to line, level, plumb, rigid, and secure. Level baseplates to a true even plane with full bearing to supporting structures, set with double-nutted anchor bolts. Use grout to obtain uniform bearing and to maintain a level base-line elevation. Moist cure grout for not less than seven days after placement.
  - 1. Make field connections using high-strength bolts installed according to RCSC's "Specification for Structural Joints Using ASTM A 325 or A 490 Bolts" for type of bolt and type of joint specified.
    - a. Joint Type: Snug tightened or pretensioned.

- G. Secondary Framing: Erect framing true to line, level, plumb, rigid, and secure. Fasten secondary framing to primary framing using clips with field connections using non-high-strength bolts.
1. Provide rake or gable purlins with tight-fitting closure channels and fasciae.
  2. Locate and space wall girts to suit openings such as doors and windows.
  3. Locate canopy framing as indicated.
  4. Provide supplemental framing at entire perimeter of openings, including doors, windows, louvers, ventilators, and other penetrations of roof and walls.
- H. Bracing: Install bracing in roof and sidewalls where indicated on erection drawings.
1. Tighten rod and cable bracing to avoid sag.
  2. Locate interior end-bay bracing only where indicated.
- I. Framing for Openings: Provide shapes of proper design and size to reinforce openings and to carry loads and vibrations imposed, including equipment furnished under mechanical and electrical work. Securely attach to structural framing.
- J. Erection Tolerances: Maintain erection tolerances of structural framing within AISC's "Code of Standard Practice for Steel Buildings and Bridges."

### 3.4 ACCESSORY INSTALLATION

- A. General: Install accessories with positive anchorage to building and weathertight mounting, and provide for thermal expansion. Coordinate installation with flashings and other components.
1. Install components required for a complete metal roof panel assembly including trim, copings, ridge closures, seam covers, flashings, sealants, gaskets, fillers, closure strips, and similar items.
  2. Install components for a complete metal wall panel assembly including trim, copings, corners, seam covers, flashings, sealants, gaskets, fillers, closure strips, and similar items.
  3. Where dissimilar metals will contact each other or corrosive substrates, protect against galvanic action by painting contact surfaces with bituminous coating, by applying rubberized-asphalt underlayment to each contact surface, or by other permanent separation as recommended by manufacturer.

- B. Flashing and Trim: Comply with performance requirements, manufacturer's written installation instructions, and SMACNA's "Architectural Sheet Metal Manual." Provide concealed fasteners where possible, and set units true to line and level as indicated. Install work with laps, joints, and seams that will be permanently watertight and weather resistant.
1. Install exposed flashing and trim that is without excessive oil canning, buckling, and tool marks and that is true to line and levels indicated, with exposed edges folded back to form hems. Install sheet metal flashing and trim to fit substrates and to result in waterproof and weather-resistant performance.
  2. Expansion Provisions: Provide for thermal expansion of exposed flashing and trim. Space movement joints at a maximum of 10 feet (3 m) with no joints allowed within 24 inches (600 mm) of corner or intersection. Where lapped or bayonet-type expansion provisions cannot be used or would not be sufficiently weather resistant and waterproof, form expansion joints of intermeshing hooked flanges, not less than 1 inch (25 mm) deep, filled with mastic sealant (concealed within joints).
- C. Gutters: Join sections with riveted and soldered or lapped and sealed joints. Attach gutters to eave with gutter hangers spaced not more than 4 feet (1.2 m) o.c. using manufacturer's standard fasteners. Provide end closures and seal watertight with sealant. Provide for thermal expansion.
- D. Downspouts: Join sections with 1-1/2-inch (38-mm) telescoping joints. Provide fasteners designed to hold downspouts securely 1 inch (25 mm) away from walls; locate fasteners at top and bottom and at approximately 60 inches (1500 mm) o.c. in between.
1. Provide elbows at base of downspouts to direct water away from building.
  2. Tie downspouts to underground drainage system indicated.
- E. Roof Curbs: Install curbs at locations indicated on Drawings. Install flashing around bases where they meet metal roof panels.
- F. Pipe Flashing: Form flashing around pipe penetration and metal roof panels. Fasten and seal to panel as recommended by manufacturer.

### 3.5 FIELD QUALITY CONTROL

- A. Testing Agency: Contractor shall engage a qualified testing and inspecting agency to perform the following tests and inspections and to submit reports.

- B. Special Inspector: Owner will engage a qualified special inspector to perform the following tests and inspections and to submit reports.
- C. Tests and Inspections:
  - 1. High-Strength, Field-Bolted Connections: Connections shall be inspected during installation according to RCSC's "Specification for Structural Joints Using ASTM A 325 or A 490 Bolts."
  - 2. Welded Connections: In addition to visual inspection, field-welded connections shall be tested and inspected according to AWS D1.1 and the following inspection procedures, at inspector's option:
    - a. Liquid Penetrant Inspection: ASTM E 165.
    - b. Magnetic Particle Inspection: ASTM E 709; performed on root pass and on finished weld. Cracks or zones of incomplete fusion or penetration will not be accepted.
    - c. Ultrasonic Inspection: ASTM E 164.
    - d. Radiographic Inspection: ASTM E 94.
- D. Correct deficiencies in Work that test reports and inspections indicate do not comply with the Contract Documents.

### 3.6 CLEANING AND PROTECTION

- A. Repair damaged galvanized coatings on galvanized items with galvanized repair paint according to ASTM A 780 and manufacturer's written instructions.
- B. Remove and replace glass that has been broken, chipped, cracked, abraded, or damaged during construction period.
- C. Touchup Painting: After erection, promptly clean, prepare, and prime or reprime field connections, rust spots, and abraded surfaces of prime-painted structural framing and accessories.
  - 1. Clean and prepare surfaces by SSPC-SP 2, "Hand Tool Cleaning," or SSPC-SP 3, "Power Tool Cleaning."
  - 2. Apply a compatible primer of same type as shop primer used on adjacent surfaces.
- D. Touchup Painting: Cleaning and touchup painting are specified in Division 9 painting Sections.

END OF SECTION 13121